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and Sanitary Schools

One-Room and Village Schools



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CIRCULAR NO. 177

F. G. BLAIR,
Superintendent of Public Instruction

ILLINOIS, 1923

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Mr (Francis G.)

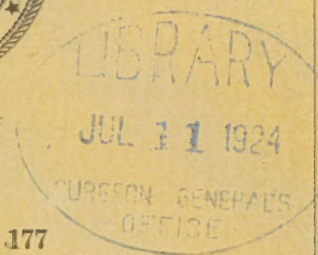
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Standard and Sanitary Schools

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One-Room and Village Schools



CIRCULAR NO. 177

F. G. BLAIR,
Superintendent of Public Instruction

ILLINOIS, 1923

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COLOR FOR WALLS AND CEILING.

The color of the cover is a good tint for the walls.

The color of this sheet is a good tint for the ceiling.

COLOR FOR WALLS AND CEILING.

The color of the cover is a good tint for the walls.
The color of this sheet is a good tint for the ceiling.

SANITARY SCHOOL ROOMS

The Law, Specifications, Suggestions to
School Officers

CIRCULAR NO. 177

F. G. BLAIR,
Superintendent of Public Instruction

U. J. HOFFMAN,
Supervisor of Rural Schools

ILLINOIS, 1923

[Printed by authority of the State of Illinois.]

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SCHNEPP & BARNES, PRINTERS
SPRINGFIELD, ILL.

1923

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A WORD TO SCHOOL OFFICERS.

This circular is issued for the use of school officers and all persons who have to do with the building, remodeling, repairing or equipping of one-teacher school houses.

The county superintendent of schools will be furnished with a supply. He should furnish a copy to all whom it may concern. When inspecting a school house he should record the results of his inspection on pages 37-38 and send the copy to the Clerk of the Board of Directors with his recommendations.

F. G. Blair
Superintendent.



THE STATE CAPITOL

Diploma

Awarded to

*School District No. 153
in the County of Sangamon*

By the Department of Public Instruction
of the State of Illinois

*For the satisfactory condition of the School, Yard,
Fires, Water Supply, Cal. houses, School Building,
Heating, Ventilation, Furnishings, Organization
and Teaching as determined by an inspection made
by this Department and recorded in the office of the
County Superintendent of Schools.*

*This Diploma will be renewed annually upon the
statement of the County Superintendent that the above
conditions remain satisfactory.*

Dated November 15th 1909



Wm. Hoffman *Chas. H. Cook, Inspector*

Renewed for the year

Renewed for the year

Renewed for the year

Renewed for the year

No. 1

F. G. P. S.

STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

SECTION 1. SPECIFICATIONS OF MINIMUM REQUIREMENTS.

MADE BY THE SUPERINTENDENT OF PUBLIC INSTRUCTION, 1923, SUPERSEDING
THOSE PREVIOUSLY MADE.

The State requires under penalty, that every child of school age shall attend school every day that schools are in session. To require such attendance in school rooms which endanger their health and safety, would be a great injustice to the children of the state. To avoid such injustice as well as to make school attendance of greatest benefit to the children, the Legislature of 1915 amended the School law providing that every school room must be constructed, furnished and conditioned to conserve the health and safety of its occupants.

The things which affect the physical well-being of the child as well as the work of the school are:

- Proper Heating
- Ventilation
- Lighting
- Seating
- Water supply
- Toilets
- Safety against fire

The statute does not specify in detail how these conditions shall be met, but it authorizes the Superintendent of Public Instruction to make such specifications. That he may have expert help in making these specifications the State Department of Health, the State Architect, and the State Fire Marshal are required to advise him. The specifications thus made have the force of law.

The enforcement of the law devolves upon the county superintendent of schools, the board of township trustees and the boards of directors and boards of education.

THE LAW GOVERNING THE SANITATION OF SCHOOLROOMS.

DUTY OF THE SUPERINTENDENT OF PUBLIC INSTRUCTION.

To make specifications.—The duty of the Superintendent of Public Instruction shall be to prepare, with the advice of the State Board of Health, the State Architect and the State Fire Marshal, for school directors and boards of education specifications for the minimum requirements for heating, ventilation, lighting, seating, water supply, toilets and safety against fire which will conserve the health and safety of the children attending the public schools. Section 3, paragraph 13.

It should be noted that these are the *minimum* requirements. School boards are not prohibited from making better provisions for sanitation and safety.

To assist County Superintendents of Schools.—To advise and assist county superintendents of schools, addressing to them, from time to time, circular letters relating to the best manner of conducting schools, constructing school houses, furnishing the same, and examining and procuring competent teachers. Section 3, paragraph 5.

To make possible the greatest assistance to school officers in the enforcement of this law the Superintendent of Public Instruction has appointed supervisors of rural schools, city elementary schools, and high schools.

These will, upon request, give assistance by correspondence or personal visit to superintendents and school boards desiring advice about plans for buildings or equipment coming under the provision of this law.

DUTY OF THE COUNTY SUPERINTENDENT OF SCHOOLS.

Approved Plans. The duty of the county superintendent of schools shall be to inspect the plans and specifications for heating, ventilation, lighting, seating, water supply, toilets and safety against fire for public schoolrooms and buildings submitted to him by boards of education or boards of directors, and to approve all those which comply substantially with the specifications prepared and published by the Superintendent of Public Instruction. Section 15, paragraph 20.

To act as the official adviser and constant assistant of the school officers and teachers in his county. In the performance of this duty he shall faithfully carry out the advice of the Superintendent of Public Instruction. Section 14, paragraph 6.

The County Superintendent of Schools may advise school officers in regard to any detail in the construction of school houses and their equipment, however, only in the requirements for heating, ventilation, lighting, seating, water supply, toilets and safety against fire is his advice obligatory upon school officers. If his interpretation of the specifications is questioned an appeal may be taken to the Superintendent of Public Instruction.

Inspect Buildings. To inspect all public schools under his supervision and notify in writing before the first day of April the board of school trustees or other boards exercising similar functions whether the several schools in their jurisdiction have or have not been kept as required by law. Section 15, paragraph 21.

It is the duty of the County Superintendent to inspect the school buildings each year, but if a record is kept it is necessary to re-inspect carefully only such as did not comply with the law, on a previous inspection. At his annual visit to the school he can readily see whether requirements are still met. The report to the Trustees annually is essential that they may know whether to withhold the distributive fund.

(To withhold State funds: § 14. Upon receipt of the amount due the county from the State school fund the county superintendent shall apportion same together with other funds held for distribution, to the townships and parts of townships in his county in which schools have been maintained as provided by law, in the manner prescribed by paragraph (e) of section 211 of this act for the distribution of the State school fund among the counties, and shall pay the distributive share belonging to each township and fractional township to the respective township treasurer or other authorized persons, annually; *provided, however,* that no part of the State or other school fund shall be paid to any township treasurer or other person authorized to receive it unless such treasurer shall have filed his bond, or if re-elected, shall have renewed his bond and filed the same as required by law.

(Funds apportioned for the benefit of a school district in which the school houses do not comply with the minimum requirements for the health and safety of the pupils as set forth by the Superintendent of Public Instruction shall be withheld by the county superintendent until the board of directors or trustees of schools comply with such requirements. Failure to comply with these requirements within a period of two years shall constitute a forfeiture of all rights to such funds withheld and the part thereof received by the county superintendent from the State for the benefit of such district shall revert to the State school fund. Section 14 as amended July 2, 1923.)

This section received the approval of the Governor July 2, 1923.)

This section is part of a bill signed by the Governor July 2, 1923. The Attorney General has advised the Auditor of Public Accounts that the law is inoperative and void. The Auditor has stated that the distribution will be made on the census basis. The Supreme Court probably will be asked to pass on the constitutionality of the law before the time for the 1925 distribution.

Condemn Buildings.—To request the State Board of Health, (Department of Health,) the State Fire Marshal, or the State Architect to inspect public school buildings which appear to him to be unsafe, insanitary or unfit for occupancy. It shall be the duty of these officials to inspect such buildings and to state in writing in what particular they are unsafe, insanitary or unfit for occupancy. Upon the receipt of such statement the county superintendent of schools shall condemn the building and notify in writing the board of directors or board of education, stating specifically the reasons for such condemnation. He shall also notify in writing the board of school trustees that the school so condemned is not kept as required by law. Section 15, paragraph 22.

The purpose of this provision of the law is to reinforce the position taken by the county superintendent of schools by the opinion of experts when he desires such reinforcement.

Only in exceptional cases, does the county superintendent need to call for assistance from more than one of the officials mentioned. In case of insanitary conditions call upon the State Department of Health: in case of dangerous condition due to structural defects, call upon the State Architect: in case of danger from non-compliance with the law relative to fire hazard, call upon the State Fire Marshal.

DUTY OF THE TOWNSHIP TRUSTEES.

Withhold Funds.—When the board of trustees has had notice from the county superintendent of schools that a district has not kept school as required by law, the part of the distributive fund apportioned to such district shall be withheld until the county superintendent has given notice in writing that the requirements of the law have been complied with. The amount withheld shall then be placed to the credit of such district: Provided, in cases where the schoolhouses were already in use for school purposes July 1, 1915, and do not comply with the minimum requirements for the health and safety of the pupils as set forth by the Superintendent of Public Instruction, the distributive fund shall not be withheld until after March 1, 1917. Section 35, School Law.

If section 14, as amended July 2, 1923, is declared constitutional by the Supreme Court, the only funds subject to distribution by the trustees after July 1, 1924, will be the income of the township loanable fund.

DUTIES OF BOARDS OF DIRECTORS AND BOARDS OF EDUCATION.

Submit Plans.—Before erecting or remodeling a public school building the board of directors or the board of education in districts containing fewer than one hundred thousand inhabitants shall submit the plans and specifications respecting heating, ventilation, lighting, seating, water supply, toilets and safety against fire to the county superintendent of schools for his approval. Section 119, School Law.

When a school room or building is remodeled or when plans are made affecting heating, ventilation, lighting, seating, water supply, toilets and safety against fire the approval of the County Superintendent must be secured. Failure to comply with the law in these respects subjects the district to the loss of its share of the State distributive fund. The purchasing or placing of desks, purchasing window shades, tinting the walls, replacing heating apparatus are occasions when the County Superintendent's approval must be secured.

HEATING AND VENTILATION.

I. ROOM HEATERS.

A room heater is a form of warm air furnace which is placed in a corner of the room. To be used in a school room it must be so installed as to bring in air from out of doors, conduct it through the furnace and deliver it in the room. Provision must also be made to withdraw air from the floor level in quantity equal to that admitted to the furnace.

The use of a bare stove or jacketed stove which does not provide for the admission of air from the outside and withdrawal of air from within the room is prohibited.

SPECIFICATIONS FOR HEATING.

No. 1. The stove within the casing or jacket shall be of suitable size to heat the room in all parts during the coldest weather to a temperature of 70 degrees F. without too hot a fire. Counting all the space to be heated, school room, classrooms, and library room, for 8,000 to 10,000 cubic feet, the grate area should be 18 inches in diameter; from 10,000 to 12,000 cubic feet 22 inches in diameter; from 12,000 to 17,000 cubic feet, 24 inches.

The heating capacity of a furnace is in proportion to the area of the grate.

No. 2. The casing which surrounds the stove shall be at least as high as the stove. The distance between the stove and casing at the narrowest place shall be not less than eight inches.

If the casing extends to the floor the duct admitting the air to furnace shall be so constructed that when the outside opening is open the inside opening shall be closed and when the outside opening is closed the inside opening shall be open.

If the casing does not extend to the floor the duct from the outside shall be so constructed that the entering cold air cannot fall to the floor, but is directed upward between the casing and the stove.

No. 3. The damper which controls the admission of air from the outside shall be closefitting and the opening from the outside shall be protected, so that the wind and rain cannot blow directly into it.

FRESH AIR DUCTS AND VENTILATING FLUES.

There are two kinds of ventilating flues, the single flue which carries both smoke and foul air and the double flue, one carrying smoke and the other carrying foul air only. The double flue is preferable, for it cannot get out of repair and smoke cannot be blown back into the room through the foul air opening. The contrivance to prevent soot falling down to the bottom of the single flue is likely to become clogged and need cleaning out. Then, too, it wears out and is difficult to replace. This causes much annoyance at times. The smoke flue of the double flue is easily cleaned if an opening is left at the base. It never gets out of order.

DOUBLE FLUE VENTILATING CHIMNEY.

For a room 8,000 cubic feet or under:

a. Cross-sectional area of smoke flue not less than 96 square inches, 8 by 12 inches.

b. Cross-sectional area of ventilating flue, not less than 192 square inches, 12 by 16 inches.

c. Cross-sectional area of register at the floor level, not less than 192 square inches, equal to 12 by 16 inches.

d. Cross-sectional area of fresh air intake in the wall near the heater, not less than 180 square inches, equal to 12 by 15 inches.

e. Outside size of chimney 20 inches wide by 32 inches long, 8-inch brick, $2\frac{1}{2}$ wide, 4 long, at least 26 feet high. The long way of the chimney must face the school-room.

For a room more than 8,000 cubic feet:

a. Cross-sectional area of smoke flue not less than 96 square inches, 8 by 12 inches.

b. Cross-sectional area of ventilating flue, not less than 240 square inches, 12 by 20 inches.

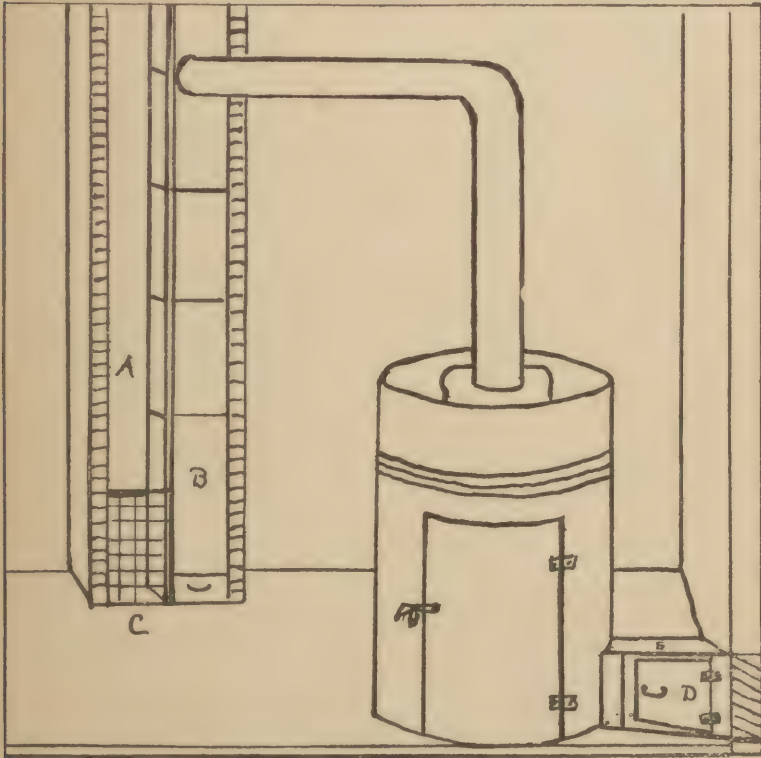
c. Cross-sectional area of register at the floor level, not less than 240 square inches, 12 by 20 inches.

d. Cross-sectional area of fresh air intake in the wall near the heater, not less than 240 inches, equal to 15 by 16 inches.

e. Outside size of chimney, 20 by 36 inches, 8-inch brick, $2\frac{1}{2}$ bricks wide, $4\frac{1}{2}$ bricks long, at least 30 feet high. If the chimney can be higher it will give better service in unusual weather.

Every fresh air duct and foul air vent should be provided with shutoffs so that they can be kept closed at night and to give control of the entering or outgoing air in unusual weather.

CONSTRUCTION OF A DOUBLE FLUE CHIMNEY.



(a) Foul air flue. (b) Chimney tile. (c) Opening into foul air flue.
(d) Door which controls supply of air to the furnace.

The grills and dampers should not take up more than one-third of the space of the openings.

The chimney should always be at least 4 feet higher than any nearby object, such as a gable or a tower.

No. 4. *Foul Air Vent.*—The cross-sectional area of the opening into the foul air vent shall not be less than the cross-sectional area of the fresh air opening in the wall.

No. 5. *Size of Room.*—All classrooms shall have at least 16 square feet of floor space and not less than 200 cubic feet of air space per pupil.

Placing so many pupils in a room that each does not have this amount of floor and air space is a violation of the law.

SINGLE FLUE VENTILATING CHIMNEY.

For a room 8,000 cubic feet or under:

a. Cross-sectional area of flue, should be not less than 256 square inches, 16 by 16 inches.

b. Cross-sectional area of foul air register at the floor level, not less than 192 square inches equal to 12 by 16 inches the small dimension upward.

c. Cross-sectional area of fresh air intake in the wall by the heater, not less than 180 square inches, equal to 12 by 15 inches.

d. Outside size of chimney 20 by 24 inches, 8 inch brick, $2\frac{1}{2}$ wide by 3 bricks long, and at least 26 feet high. The long way of the chimney must face the schoolroom.

For a room more than 8,000 cubic feet:

a. Cross-sectional area of flue, not less than 256 square inches, 16 by 16 inches.

b. Cross-sectional area of foul air register at floor level not less than 256 inches, 16 by 16 inches.

c. Cross-sectional area of fresh air intake in the wall near the heater, not less than 240 square inches, equal to 15 by 16 inches.

d. Outside size of chimney, 24 by 24 inches, 8-inch brick, 3 bricks by 3 bricks and at least 30 feet high.

SUGGESTIONS FOR HEATING AND VENTILATION.

There are many schoolroom heaters on the market. Some no doubt are better than others, but the difference is not so much a matter of construction as it is of durability of material and proper installation. All the requirements set forth in foregoing pages should be strictly complied with. The County Superintendent's approval should be secured before the heater is purchased and his approval of the installation should be had before the heater is paid for.

In making a contract for a heater and installation both parties to the contract should clearly understand that this is necessary, otherwise in case of disapproval both parties will be embarrassed and suffer loss.

IMPORTANCE OF TIGHT FLOORS AND CEILINGS.

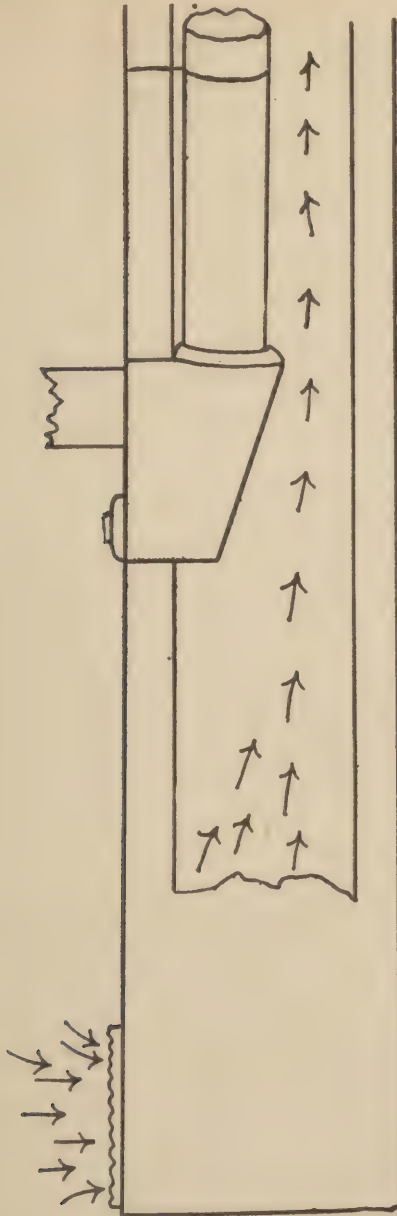
It must be borne in mind that no room heater and ventilator can do satisfactory work if the floor is not tight and when the foundation is so open that it is as cold under the house as it is outside. Every school-house should have a tight foundation with no holes except for the ventilation of the space under the house. These should be closed up in winter.

A room heater warms the floor by heating all the air in the room. As the cold air remains on the floor while the warm air rises to the top, if the cold air comes in so fast that it cannot move to the stove fast enough to be heated, a layer of cold air remains on the floor while at the ceiling it may register 100 degrees.

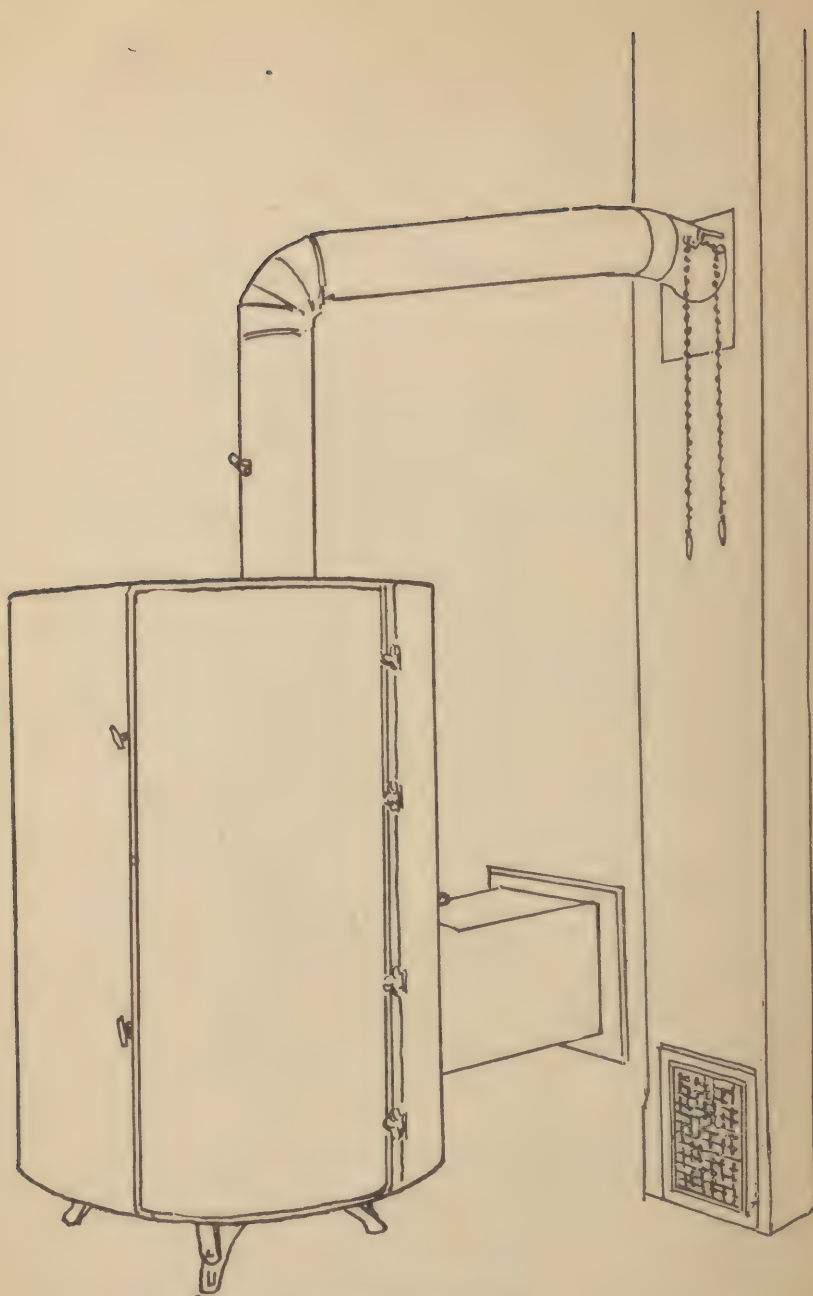
The ceiling also must be tight or the warm air will escape into the attic,

Board ceilings may be made tight by fitting building paper between the rafters in the attic, and tacking it down so that it will fit snug and not be moved by air pressure.

Before installing a heater, see to it that the foundation, floor, windows and ceiling are tight.



Single Flue Ventilation.



Jacket off the floor.

INSIST UPON A GUARANTEE.

When buying a heater, insist upon a contract and guarantee that the heater will heat and ventilate the room in a satisfactory manner. If the salesman undertakes to give you satisfactory results when the condition of the chimney, floor and ceiling are such as to make satisfaction impossible, let the loss be his rather than that of the district.

The only safe way is to have a clause in the contract to the effect that at least one-half of the price shall not be paid until the heater has stood the test of severe weather. This will make the salesman more careful about trying to do the impossible.

WHY VENTILATION IS NEEDED.

The body needs clean, wholesome air as much as it does clean and wholesome food. We breathe the air for two purposes. First, to get the oxygen needed by the body. Second, to remove the worn out parts of the body. Every breath of air coming from the body is unclean. It contains water and organic matter which has come out of the system in the form of vapor. It contains too much carbonic acid gas and may contain disease germs. If this air is breathed again, there is not enough oxygen in it to be good for the body and it contains the impurities from the previous breathing. When the air has been breathed a second time, it becomes dangerous to health. Thirty children in an ordinary schoolroom breathe all the air in a half hour. In an hour and a half the same air has passed through the lungs of the children three times. Is not this about the most unclean practice of people who mean to be clean? It is most revolting, yet this is not the worst. The injury to the children's health is what should concern us most. Colds, catarrh, headaches, nervousness, languor, listlessness, aversion to activity, lack of ruggedness are often due to bad ventilation. Children in this condition of body and mind cannot make the progress in school work which we expect of them.

LOCATION OF THE HEATER.

Wherever possible the heater should be located in the end of the room in which is the entrance. The cold air coming in when the door is opened will then be taken up by the heater. If it is at the end opposite the entrance the entering cold air will flow over the feet of the children on its way to the heater. It is better to have the children face away from the door and the teacher face the door. The heater is much in the way when in the end of the room in front of the children.

DANGER FROM COUGHING AND SNEEZING.

There is great danger of spreading disease germs by coughing or sneezing into the open. This is especially true of the germs which cause colds, influenza, diphtheria, scarlet fever, and tuberculosis. Pupils should be trained to cough or sneeze into a handkerchief held close to the nose or mouth. Good ventilation will lessen the spread of these diseases if this practice is observed.

THE BEST WAY TO VENTILATE.

The best way to ventilate in cold weather is to bring the outside air in through the heater, and to remove the foul air from the floor. The clean air from the outside is brought through the heater, is warmed and rises to the top of the room. The foul air in the room being colder sinks to the floor and the ventilating flue removes it from the room. Thus a current of clean air is running in and a current of foul air is running out, the children breathing health-giving instead of disease-producing air. The heaters and ventilators do the work if they are properly placed in school houses properly built. They will not do the work in the houses which are full of openings and no more fitted to keep out cold than is a tent.

WINDOW VENTILATION NEEDED.

Even when room heaters and basement furnaces supplying air from the outside are used, window ventilation is needed much of the time.

Always at intermissions the windows should be opened and the air flushed out. Five minutes is sufficient time.

When the outside temperature registers between 50 and 70 degrees a little fire is needed, but it is difficult to keep the room at the right temperature. It gets too warm and the air is unfit to breathe. Under these conditions the ventilating apparatus removes only a small amount of air. Windows should then be opened. Only in very cold weather should the ventilating apparatus alone be depended on.

HOW TO OPEN WINDOWS.

If the windows are opened below the cold air blows directly on the children, falls to the floor and makes the children sit in cold air a foot or more deep.

If the windows are opened too wide at the top the cold air falls down on the children without mixing with the warm air in the room.

Three or four windows should be lowered from the top, one inch in cold-est weather. The blowing of the wind must be taken into consideration. If possible open windows on the opposite side from which the wind blows. When windows are on the windward side only, the size of the opening should be regulated so that cold air does not fall on the children. Thus lowering the windows leaves also an opening of equal size where the lower and upper sash meet. Through these narrow openings a thin layer of air is admitted. This readily mixes with the warm air in the room and when it comes down to the children it is no longer cold.

II. BASEMENT FURNACES.

When heating a schoolroom with a basement furnace the same provision must be made for ventilation as are set forth for room heaters. There must be a foul air outlet at the floor level and there must be an outside air intake to the base of the furnace.

The basement furnace is more expensive and it takes a good deal more coal, for there is so much heat generated which does not get into the schoolroom, but remains in the basement.

THE VALUE OF A BASEMENT.

A basement as large as the floor area of the room seven or eight feet high with a good concrete floor is a great addition to a one-teacher school. Much use can be made of it in the regular work of the school. It serves as an excellent play room in bad weather. The community can make use of it when meetings are held. Warm lunches can be easily provided and work with tools, and studies in agriculture can be carried on without disturbing the rest of the school or littering up the room.

As much care should be used in the construction of the basement as in the school room. The floor should be concrete and drainage provided so that the floor can be easily washed. The water supply should be in the basement. The walls and door of the coal room should be so tight that dust cannot escape into the school room or basement room. The room should be ceiled.

Only when such a basement is provided should a basement furnace be installed in a one-teacher school. To have a furnace under the house in an excavation only large enough for the furnace and the fuel is a great waste of school funds, adds greatly to the labor of the teacher and is unsatisfactory. The room heater is much better where a good basement room is not provided.

A good janitor should be employed. The care of the furnace is too heavy work for a woman teacher. Very few of them know how to manage it and few ever learn. A large boy cannot be depended upon to properly care for the furnace and the school room.

SPECIFICATIONS FOR BASEMENT FURNACES.

No. 6. *Ventilation*.—If a basement furnace is used, provision shall be made to bring in outside air through the furnace and for removing foul air from the room through a foul air duct. The duct supplying the air to the furnace shall have a cross-sectional area at its narrowest place of at least 400 square inches. For a larger furnace, it shall be more. The cross sectional area of the foul air vent shall not be less than the cross sectional area of the fresh air opening. The door closing the outside air opening shall be so placed that when open it prevents the air from outside blowing into the room. All rods controlling the furnace or the ventilation shall be operated from the school room.

No. 7. *Entrances*.—to the basement shall be from inside the room and from outside.

No. 8. The floor of the basement shall be concrete.

No. 9. *The warm air duct* from the furnace to the school room shall extend at least six feet above the floor and the cross-sectional area shall be at least 400 square inches at the narrowest point. The opening of the foul air flue shall be at the floor level and so constructed as to be heated by the smoke flue to cause an upward current.

No. 10. *The cold air duct* to the furnace shall be composed of two compartments, one to convey air from the outside, and from the inside of the room when desired. The other compartments shall convey air from the room only and shall be open at all times. The combined cross-sectional area of these ducts shall be not less than 400 square inches and the duct conveying the outside air shall be not less than 180 square inches. The cold air duct shall receive the air at the floor level.

The duct for the outside air shall have an opening from the outside at least 10 by 18 inches. This shall be provided with a door hung at the top of the opening and swing inward so that it closes the opening from the room into this duct. But when the door is closed the air from the room may pass down this duct. See pages 18 and 20.

The return air duct shall be protected by a wire mesh and above this may be a covering which will serve as a stand or table.

No. 11. *A foot and body warmer* shall be placed at the floor level. This should be placed in the warm air duct, closed with a door hung at the top of the opening and swung inward. When the lower opening is closed by this door all the warm air comes out at the upper opening. When the door is opened, it closes the duct above and causes the warm air to come out at the lower opening onto the body of those standing before it.

No. 16. Ample provision shall be made for moisturing the heated air.

SUGGESTIONS FOR INSTALLING BASEMENT FURNACES.

Before installing a furnace the plans should be approved by the County Superintendent. After the installation his approval should be secured before final payment is made. This is necessary to assure compliance with the law and to guarantee the satisfactory working of the furnace. It should be stipulated in the contract that the installation shall comply with the law and that payment in full shall be made only after the final approval of the County Superintendent of Schools.

THE PIPELESS FURNACE NOT LAWFUL FOR SCHOOL ROOMS.

The so-called pipeless furnace does not meet the requirements of the law in any particular, nor can it be so installed as to meet the requirements. County Superintendents should not approve its use or ignore its use when in-

stalled without their approval. The following letter from the Director of the State Department of Health should convince any one that such heating is injurious to the children.

STATE OF ILLINOIS
DEPARTMENT OF PUBLIC HEALTH
SPRINGFIELD

November 15, 1922.

Subject: SCHOOL SANITATION
Pipeless furnaces.

HON. FRANCIS G. BLAIR,
Superintendent of Public Instruction,
Springfield, Illinois.

DEAR SIR:

In response to your letter of October 26 requesting the opinion of this department relative to the suitability of pipeless furnaces for heating schools, I would advise that this department does not consider pipeless furnaces satisfactory for heating school buildings.

The pipeless furnace does not provide for fresh-air intake and for foul-air outlet, and consequently with such a heating unit in a school the air would be depleted of its oxygen and have a high carbon-dioxide content and the humidity would be low. It is very essential to the health of school children that proper air conditions be maintained and especially that the humidity does not fall so low as to cause dryness in the respiratory tracts. It is, of course, also essential that proper volumes of fresh air be provided so as to maintain proper oxygen content.

Because of the lack of provision for suitable fresh-air intake and foul-air outlet we consider that the use of pipeless furnaces for schools should be prohibited.

Sincerely yours,

(signed) ISAAC D. RAWLINGS, M. D.
Director.

A GOOD WAY TO INSTALL A FURNACE.

The illustrations on pages 18-20-21 will give a clear idea of how to install a furnace which will meet the requirements in Nos. 9, 10, 11. The most essential requisite is an ample supply of air to the furnace to be warmed and ample facility for the warmed air to rise into the room. To secure these results both ducts must be large enough and as nearly perpendicular as they may be made. The cold air to the furnace should go straight downward and the warm air straight upward. Long horizontal ducts should be avoided. The air should come in and go out at the same wall. This insures a complete circuit of air for the warm air rises to the top of the room and moves to the opposite side. The cold air moves from the opposite side back to the wall where the ventilating shaft is situated.

Two rooms can be well heated with one large furnace. But care must be taken to make the ducts large enough and the ventilating duct in the chimney should carry away as much air as the ducts from the outside can bring in. Whenever two rooms are heated with one furnace a damper should be placed in each warm air shaft so that the flow of air can be checked in one and forced into the other. When there are north and south, east and west rooms the heat is with difficulty forced into the room in the direction from which the wind blows and it more readily flows into the opposite room. If the flow into the room away from the windy side be checked the warm air will flow into the other in larger quantity. To heat larger buildings a fan should be installed to force the air through the furnaces into the rooms.

SECTION BB.

The furnace is located two or three feet from the wall at the end of the basement. One short 23-inch pipe conducts the heated air into the warm air duct, which is 16 by 28 inches and enters the room 6 or 7 feet above the floor. This warm air duct extends to the basement floor. The damper to turn the warm air out at the foot warmer and the manner of hanging is also shown.

FIGURE C. C. RETURN AIR.

This is a side view of the return air duct. This is composed of two compartments—one for the outside air and the other for the return air from the room. A front view of this is shown in Fig. A. A. It is shown in perspective in Fig. D. The door for the outside opening is hung at the top and swings inward. The outside air compartment is open at the top. When the door is closed, the air from the room goes down this compartment as well as down the return air compartment. But when the door is open to admit the outside air it is drawn up and closes the opening of that compartment from the room. The door should fit snug at both inside and outside openings.

This will prevent cold air blowing up into the room. At night and when it is desired to warm the room quickly the door should be closed and if it fits closely no outside air can get in. Then only the air from the room is circulated through the furnace.

Above the opening in the floor there should be erected a stand and on two sides about the legs of the stand there should be wire mesh to prevent dirt from falling into the opening.

The opening from the outside should be protected from the rain and the direct wind, as shown in the figure.

The return air duct should be made of matched lumber, as should the door, but the duct from this to the casing of the furnace should be of galvanized iron covered with boards.

The size of this opening in the floor should be 18 inches (the width of the chimney) by 30 inches. The outside air compartment should be 12 by 18 inches. The return air compartment from the room will be about 18 by 21 inches. The opening to the outside should be 10 by 16 inches.

SMOKE, VENTILATING FLUES AND WARM AIR DUCT.

These are shown in section B. B., A. A. and Fig. D. These are constructed of brick. The smoke and ventilating flue extend out four feet above the comb of the roof. The warm air duct need be only as high as the ceiling. The flue and the duct should be 9 bricks wide and 3 bricks deep, 72 by 24 inches. The ventilating and smoke flue which extend out at the roof should be 40 by 24 inches, 5 bricks by 3 bricks. The inside measure of the smoke flue is 16 by 12 inches. The vent flue is 18 by 16 inches. The dividing wall between these should be made by laying the bricks on edge so that the wall will be as thin as possible. If a 12 by 12 inch chimney lining is used for a smoke flue a dividing wall is not necessary. But the smoke flue from the smoke pipe opening to the school room floor should be of brick and the chimney lining rest on this short brick flue. There is danger of cracking the chimney lining where the intense heat from the smoke pipe enters. There is no danger three feet above the entrance. The vent flue opening is provided with a door hinged at the bottom so that it opens inward. The opening should be 18 by 16 inches. At night and at other times when it is desired to heat the room quickly the opening should be closed. But it should be open when the school is in session and the room is warm. At night the outside air opening should also be closed but open when school is in session.

The warm air duct is provided with two openings. The one above should be open all the time. Wire screening should be used to prevent objects being thrown in. The lower opening is at the floor level and is provided

with a door hinged at the top and swinging inward. When it is closed the warm air enters through the upper opening. When it is desired to throw the heat on the feet and body of the children the door is pushed inward which prevents it from going up to the top and throws it out at the floor level. Both these openings should be the same size as the inside of the duct. The door should be controlled by a rod substantially fastened.

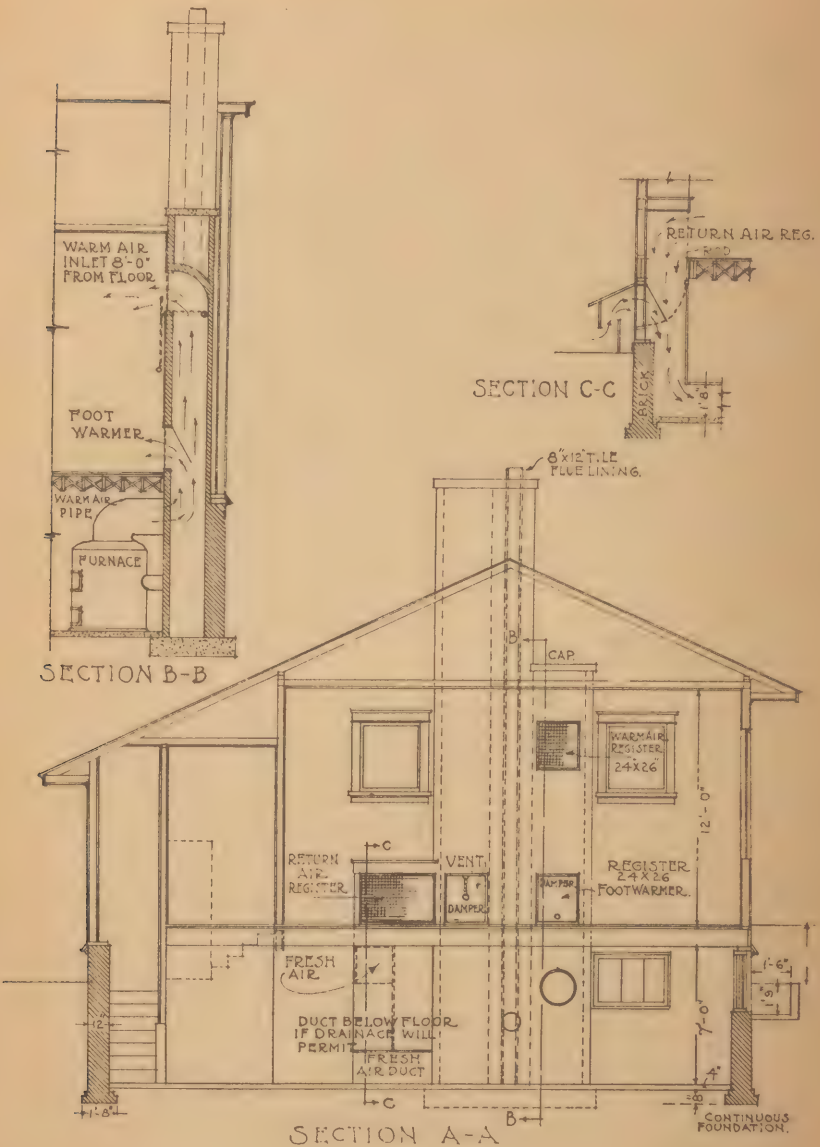


FIGURE A. A.

This is a view facing the end of the room where the furnace is installed. Here is shown the vent register at the opening into the ventilating chimney. The warm air register is shown; also below this the foot warmer. The return air register is shown, as is the stand above it. Below this is the two compartment return air duct and the opening for the admission of outside air. The opening through the floor for the return air duct shall be 18 by 30 inches.

SUPPLY OF AIR TO THE FURNACE.

The warm air furnace is dependednt on the fact that warm air is lighter than cold air. When air is warmed it rises and the colder air descends. The room is warmed by filling it with warm air from the furnace. But warm air will not go into the room unless the air already in the room moves out. The ventilating flue, if warmed, causes the air in the room to move out. The return air duct to the furnace also carries the cold air out of the room but back to the furnace. As soon as the cold air in the room has been replaced by warm air the room is warm.

If the air does not go to the furnace fast enough, it becomes overheated, but does not move into the room fast enough to fill it down to the floor. Then the upper part of the room is very warm but the floor and where the children sit is cold. Hence, the air ducts to the furnace should be large enough to carry the air out of the room to the furnace rapidly and in large quantity.

WARM AIR DUCT TO THE ROOM.

If the warm air from the furnace does not flow away fast enough it becomes overheated but does not fill the room fast enough to displace the cold air on the floor. Hence, the air duct from the furnace to the room should be large enough to carry the air away rapidly and in large quantity.

The success of the furnace depends almost wholly on the capacity of the air ducts to carry a large quantity of air to and from the furnace. Long pipes with turns in them prevent the rapid flow of air and should be avoided.

The method of installing here recommended avoids long pipes.

The warm air duct should be 28 by 16 inches which gives a capacity of 405 inches when we deduct one inch for the thickness of the plastering. This will be 4 bricks long and 3 bricks wide. The opening into the room should be 28 by 24 inches.

SIZE OF FURNACE AND DUCTS.

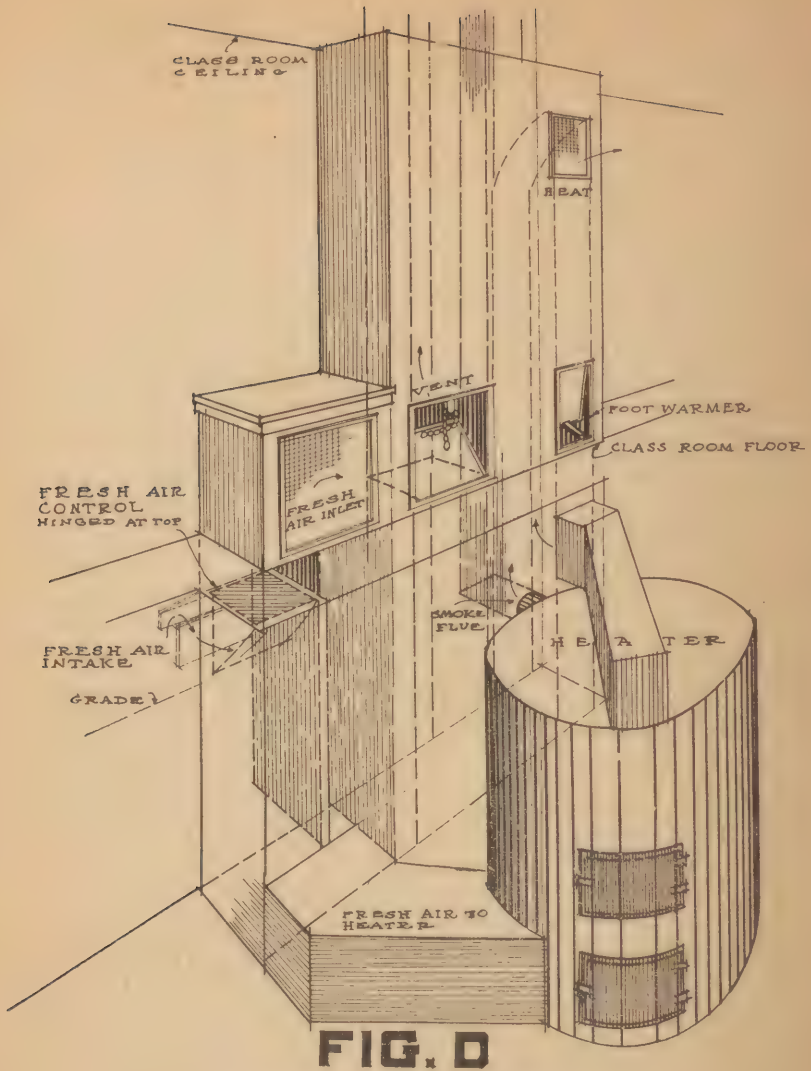
The heating capacity of a furnace is measured by the size of the grate.

To heat a room of 8,000 cubic feet the grate area should be 22 inches in diameter. The air ducts should have a cross sectional area of not less than 400 square inches at the narrowest point. For a room of from 11,000 to 17,000 cubic feet the grate area should be 24 inches in diameter and the air duct should have a cross sectional area of not less than 600 square inches. For a room from 17,000 to 22,000 (two-room building) cubic feet the grate area should be 27 inches in diameter and the air duct should have a cross sectional area of not less than 800 (two ducts) square inches.

The entire floor area, school room, cloak rooms and library room must be included in computing cubic feet.

LOCATION OF THE CHIMNEY.

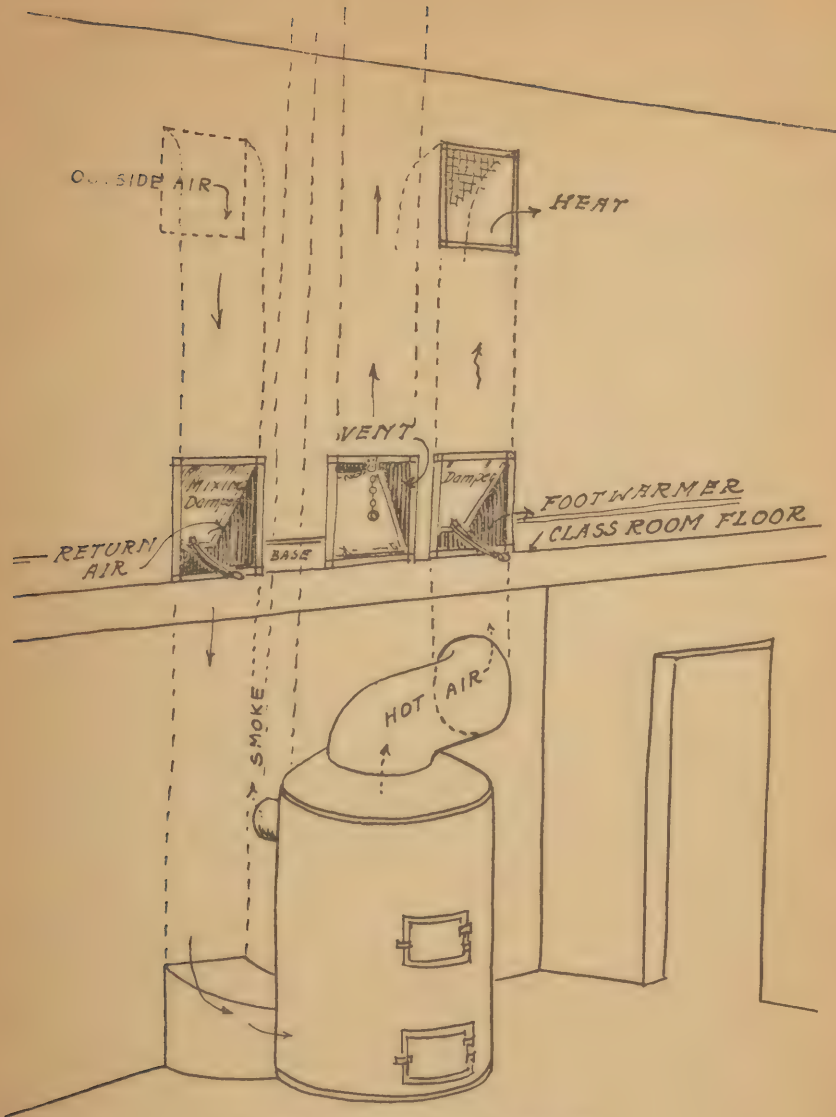
In this illustration the chimney and warm air duct are on the inside of the room. If it is desired to place the chimney on the outside the construction should be similar to that shown on page 21.

**FIG. D**

Installation when chimney is inside.

HEATING OF TWO ROOM BUILDINGS.

A two room building can be satisfactorily heated with a furnace of sufficient capacity. But, the greatest care must be exercised to provide ample circulation through the furnace. Dampers must be placed in the warm air pipes so that the heat can be reduced in one room and forced into the other when winds are unfavorable to heating one of the rooms.



Installation when chimney is outside.

HEATING HOUSES OF MORE THAN TWO ROOMS.

Three or more rooms cannot be satisfactorily heated with one furnace unless the heat is forced into the rooms with a fan. Steam heat with the direct indirect ventilation is the most satisfactory for a building of three or more rooms.

LIGHTING.

REQUIREMENTS FOR LIGHTING.

No. 17. The walls shall be a soft light tint, gray or tan. The ceiling shall be a very light tint.

No. 18. In school buildings hereafter erected or remodeled the windows shall be at the left of the seated pupils. Windows at the back of the room are permissible, but shall be at least 6 feet from the floor.

No. 19. The windows at the left shall be set with the least possible space between them and shall be not less than 3 feet nor more than 4 feet from the floor.

No. 20. The glass surface in study rooms shall be not less than one-fifth of the floor space. When the light is from the north only or when trees are near by, it shall be not less than one-fourth of the floor surface.

No. 21. All windows shall be provided with good adjustable translucent shades.

No. 22. In old buildings windows in the wall which the seated pupils face shall be permanently walled up, so that no light may enter from that direction.

No. 23. If there are full length windows on the right toward the front of the seated children, the lower sash shall be covered so as to completely shut out the light from that part. If this makes the light insufficient, additional windows shall be provided at the left.

There shall be no windows in the wall which the seated school children face.

SUGGESTIONS FOR LIGHTING.

The light of schoolhouses is a matter of far greater importance than people generally are aware of. The amount of reading and writing which children do in school today is quite unknown to their parents. The use of print is especially hard on the eyes of the young. The eye strain which results from bad lighting is the cause of many ills the cause of which few except the physician or the oculist know.

Light from in front is especially very injurious. It shines directly into the eye while the child is looking at the printed page. Though he may be able to shut it out by bending his head down or holding the book between the eye and the light, yet when he takes his eyes off the book the light flashes into them, causing a sudden readjustment of the muscles.

Light from both sides in front of the child is quite as bad, for he is not able to escape from light coming directly into his eyes. The light coming from both sides and crossing in the eye causes eye strain. All new buildings should admit the light from the left only.

When the room is more than 23 feet wide the light from one side may not carry across the room leaving one side too dark. In such cases high windows on the right side at least 6 feet from the floor should be used. These are so far above the eyes of the children that no harm is done. In the case of buildings already in use the evils of cross lighting can be mitigated by covering the lower sash of the windows on the right. Only the lower sash of the windows on the right in front of the children need be completely closed. Movable window shades should not be used, nor should the glass be painted. They can be covered with wall board and this covered with burlap to serve as a bulletin board. The better plan is to remove the sash and wall up to the opening.

The windows behind the pupils need not be closed, as from these no light comes directly into the eyes of the children.

Most of the school rooms have not enough light. The window shades are opaque and when the sun shines the teacher draws them at least half way down. The next day is cloudy and she forgets to raise the shades. Nearly always the north windows are shaded half way down. To mitigate this evil the shades should be white or a cream color and translucent. These keep out the direct rays of the sun but admit a great deal of light.

Opaque shades should never be used in a school room. The only purpose in the use of shades is to shut out the direct rays of the sun. Opaque shades do this but they also shut out the light making the room too dark. White translucent shades let in just enough light and shut out the direct rays of the sun. No shades should be placed on north windows.

WINDOW SHADES.

If shades are hung at the top of the window they deprive the opposite side of the room of light. They also interfere with opening the window at the top for ventilation.

If they are hung at the bottom to roll upward, they are likely to be torn off by the movement of children about the room. They interfere with opening the window at the bottom and when drawn completely up they shut out more light than is necessary.

The best plan is to use double roller shades hung at the middle of the window. One part can be drawn upward and the other downward.

A good sized space can be left uncovered at both top and bottom and just shut out the offending rays. Windows can be opened above and below and the shade is not whipped by the wind.

TINTING THE WALLS.

The walls of a schoolroom should be tinted so as to afford the children the best light and in such colors as are most restful to the eyes. To tint all the surfaces, ceiling and walls the same color is always bad, especially if the color is dark. It makes the room look like a cave. Paper should not be placed on new walls. It will not stay on and is insanitary. Alabastine or a similar preparation is the best. It is inexpensive, any one can apply it and it will stay. The proper colors can be easily obtained. Two schemes are recommended, one in gray and one in tan. The wainscoting should be a chocolate brown, the walls up to the border should be a light gray or tan. The border and ceiling should be a cream color.

When tan is the prevailing color the wainscoting should be brown, the walls tan, the border and ceiling a light cream. If paint is used, it should have no gloss.

The colors recommended give the room a homelike, cheerful look, and make the light more favorable than any other colors. A dark ceiling greatly darkens the room. It absorbs the light instead of spreading it over the room. When a room is ceiled with hard pine the walls may be left the natural color but the ceiling should be painted a light yellow, but if the wood has become dark the walls and ceiling should be painted with flat paint.

SEATING.

REQUIREMENTS FOR SEATING.

No. 24. Each school room shall be furnished with single desks which are of the proper size and adjusted for the pupils who occupy them.

ONE ROOM SCHOOLS.

No. 25. In one-room schools attended by children of all ages, if stationary desks are used, they should be of five sizes No. 6, 5, 4, 3, 2.

No. 26. If adjustable desks are used, they should be of three sizes—small, intermediate, and large.

No. 27. Desks of only one size shall be placed in rows from the front to the back of the room. If it is necessary to place more than one size in the same row, the last of the smaller desks shall be a "rear" and the first of the larger desks shall be a "front" and these shall have no space between them.

No. 28. There shall be an aisle between the row of desks and the wall not less than 24 inches wide and between the rows not less than 20 inches wide.

GRADED SCHOOLS.

No. 29. If stationary desks are used and one grade occupies the room, there shall be at least two sizes suitable to the size of the children. If more than two grades occupy the room, more sizes of desks suitable to the children shall be used.

No. 30. If adjustable desks are used, they shall be of suitable size and properly adjusted.

No. 31. Floors, desks, furniture and walls shall be kept free of dust and cleaned when necessary.

SUGGESTIONS FOR SEATING.

SIZES OF DESKS.

No. 6 desks are for six and seven year old children. Grades 1 and 2.

No. 5 are for eight and nine year olds. Grades 2 and 3.

No. 4 are for ten and eleven year olds. Grades 3, 4 and 5.

No. 3 are for twelve and thirteen year olds. Grades 4, 5 and 6.

No. 2 are for those fourteen and upward. Grades 7 and 8.

No. 1 are too large for elementary school children.

DISTANCES APART OF DESKS.

No. 6 and 5 should be placed nine inches apart from edge of desk to back of seat.

No. 4, ten inches apart.

No. 3, eleven inches apart.

No. 2, twelve inches apart.

In case of children of unusual size, desks should be placed apart so that when sitting erect with back against the back of the seat, the edge of the desks come within two inches of the body.

SIZES OF DESKS FOR GRADED SCHOOLS.

First grade room, No. 6 and enough No. 5's for children of unusual size.

Second grade room, an equal number of 6's and 5's.

Third grade rooms, No. 4's and enough No. 5's for unusually small children.

Fourth grade room, No. 4's and enough No. 3's for unusually large children, and 5's for small children.

Fifth grade room, No. 3's and enough 4's for unusually small children.

Sixth grade room, No. 3's and enough No. 2's for unusually large children, and 4's for small children.

Seventh grade room, No. 2's and enough No. 3's for unusually small children.

Eighth grade room, No. 2's and 3's for larger and smaller children.

ADJUSTING DESKS.

The small size is suitable for the first, second, and third grade.

The intermediate size is suitable for third, fourth, and fifth grades.

The large size is suitable for sixth, seventh, and eighth grades.

The seat should be raised or lowered to a position so that when the child is seated the thigh is horizontal when the heel rests on the floor and the knee is bent at right angles.

The desk should then be placed at a position an inch above the elbow when bent at right angles the upper arm hanging parallel with the body.

THE IMPORTANCE OF PROPER SEATING.

First as Affecting Health.—It has only recently been discovered that many weaknesses of the system are due to spinal malformations. The nerves supplying the vital organs come largely from the spinal cord and through the spinal column between the vertebrae. When the spine is out of shape, these nerves are compressed and their work interfered with.

Second as Affecting Success in Life.—A misshapen person is handicapped in the contest for success in life. A well-formed body is the greatest recommendation to a young man seeking to win a place in the world's work. It is criminal negligence to compel growing children to sit six hours of the days in school desks which deform their bodies.

Third as Affecting School Work.—Good order and good school work can not be secured when children can not sit still in comfort. Many a school is hard to manage and the work is poor because the children have not comfortable seats.

SINGLE DESK ONLY ARE LAWFUL.

The double desks should be discarded. The saving in expense in buying double desks is so small as to be unworthy of consideration. The advantage of single desks is very great. Such a school is easier to teach and the pupils find it easier to study and to conduct themselves properly.

The requirement that each child shall occupy a desk by himself is justified also purely by health reasons. The probability of infection from colds, sore eyes, itch and parasites is much greater when two occupy the same desk.

RIGHT AND WRONG SEATING ILLUSTRATED.



Fig. 1

Fig. 2

Fig. 3

Figures 1 and 2 show an 8-year old boy seated on a No. 3 seat and writing on a No. 3 desk. Either posture is uncomfortable and injurious to the right development of his spine, shoulders and chest.

Figure 3 shows the boy at the same desk moved closer to the seat. This makes it better for his back, but the proper development of his shoulders is interfered with and he is uncomfortable because his heels do not rest on the floor, and the desk is too high.



Fig. 4.

Fig. 5.

Figure 4 shows the boy seated on a No. 4 seat with a No. 5 desk in front. His heels do not rest on the floor, causing too great a pressure on the nerves and blood vessels of his legs. He is able to sit still but a few minutes.

Figure 5 shows the boy seated on a No. 5 seat with a No. 5 desk in front with the proper space between. This induces the right posture and makes a wrong posture almost impossible. This gives him physical comfort and makes the proper development of his body possible.



Fig. 6.

Fig. 7.

Fig. 8.

Figures 6 and 7 show a 12-year-old boy seated on a No. 3 seat with a No. 3 desk in front. The too great distance apart causes him to assume these incorrect and injurious postures.

Figure 8 shows the boy in a proper and comfortable posture, induced by the right size of desk properly spaced.



Fig. 9.

Fig. 10.

Figures 9 and 10 show a 7-year-old child on a No. 5 seat with a No. 5 desk in front. Figure 9 shows the desk and seat too far apart. In figure 10 the desk and seat are the right distance apart, but both are too high. Six- and 7-year-old children should be provided with No. 6 desks and seats.



Fig. 11.

Fig. 12.

Figure 11 shows a 9-year-old child sitting on a No. 5 seat with a No. 5 desk in front. The seat and desk being too far apart induce the posture which will cause rounded back, a forward stoop and flat chest.

Figure 12 shows the same child properly seated, desk and seat the right size—No. 5—and the right space between. This provides every means of comfort and a chance for right physical development.



Fig. 13.



Fig. 14.

Figures 13 and 14 show a form of adjustable desk properly adjusted and spaced. These are made in three sizes—the smallest for children from 6 to 9 years; the second for those from 9 to 12 years and the largest for those over 12 years.

WATER SUPPLY.

REQUIREMENTS FOR WATER SUPPLY.

No. 32. *Wells*.—All dug, bored or drilled wells shall be made absolutely safe from danger of contamination from privies. The walls of dug wells shall be constructed so as to prevent seepage from this source. Where there is any likelihood of sewage entering the well the privy vaults shall be made water-tight. Less than 100 feet distance from a privy is not a safe location for a well.

To prevent contamination from other sources the well shall be covered with a concrete platform. This shall rest on a concrete wall surrounding the well, sunk at least 2 feet in the ground. A concrete gutter should be provided to carry the waste water at least 10 feet away from the well. The earth shall be so banked about the well as to make natural drainage and prevent puddles of water near the well.

No. 33. *Cisterns*.—Where cisterns are used they shall be provided with effective filters and shall be completely covered. They shall be thoroughly cleaned and the filtering material renewed at least once a year.

No. 34. *Water Containers*.—Where drinking water is kept in the school-room it shall be kept in a clean container, provided with a cover and a faucet.

No. 35. *Individual Cups*.—The use of the common drinking cup is prohibited by law. When cups are necessary each person shall be provided with his own cup. The cups shall be kept clean.

No. 36. *Bubbling Fountains*.—Bubbling drinking fountains are strongly recommended.

No. 37. *Suspicious Water*.—If, for any reason, water used in school-rooms appears to be unwholesome, application should be made to the State Department of Health, Springfield, Ill., for an examination of the water.

SUGGESTIONS REGARDING WATER SUPPLY.

The schoolhouse well is looked upon as dangerous. There is no reason why it should be so if the proper precaution is taken. A dug well should be covered with a concrete top. This should rest on a concrete wall around the well, sunk 4 feet into the ground. A drain trough or pipe should convey the water to a point at least twenty feet from the well. Pools of water should not be allowed to collect within 20 feet of the well.

When a well is impossible, a cistern should be provided. The best form is a cistern of two compartments. The one should be 10 feet deep and the pump should be placed in this. The other should be built alongside and 4 feet deep. At the bottom of this should be an opening into the other, arranged so that the water which flows from the roof into the shallower one shall percolate through a thickness of 2 feet of clean sand. If care is exercised to clean these before school opens and let the water in only after the rain has washed the roof, palatable and wholesome water will be available.

It was thought that the abolition of the common drinking cup in the schools would secure greater safety from contagious diseases. Experience has shown that the individual cup in the care of the pupil is no improvement. The children keep the cups in their desks or pockets. They use each other's cup, which becomes contaminated and is quite as dangerous as the common cup. If individual cups are used they should be kept in a case with a door, each cup on its own hook. The teacher should see to it that they are scalded every few days.

The only effective way to safeguard the children against danger from the drinking cup is to install a bubbling fountain.

When the water must be carried from a neighboring well it should not be kept in an open bucket in the schoolroom. Dust collects on the water, which may be the worst contamination.

A water tank or cooler with a self-closing faucet should take the place of the open water bucket if the water must be kept in the house and the bubbling fountain can not be at hand.

TOILETS.

REQUIREMENTS FOR TOILETS.

No. 38. *Indoor toilets.*—When indoor toilets are provided those for the different sexes shall be approached from different directions and if there is a door between the two toilet rooms it shall be kept locked. The toilet rooms shall be ventilated in such a way as to remove all odors and prevent their spread to other parts of the building.

No. 39. *Outdoor Toilets.*—There shall be at least two toilets, one for each of the sexes. They shall, when possible, be at least 50 feet apart. Under no condition shall they be less than 20 feet apart. When the distance between the toilets is less than 50 feet, there shall be a tight board screen midway between them at least 20 feet long and 7 feet high. The approaches shall be separate all the way.

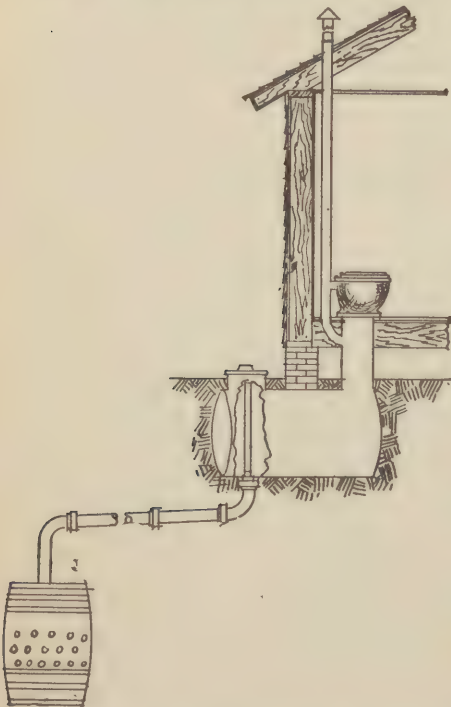
No. 40. The boys' toilet shall have a tight board screen at the front and the side not less than 7 feet high. Behind this shall be substantial zinc lined urinal troughs. The lower one shall be 16 inches from the ground and the higher one 26 inches from the ground at the highest point. When dry closets are used the urinals shall drain into a separate underground receptacle. The girls' toilet shall have a screen in front of the door.

No. 41. The toilet buildings shall rest on a substantial brick or concrete foundation to which they shall be securely bolted. The

buildings shall be well lighted and shall constitute an adequate protection against inclement weather. There shall be at least two seats and not fewer than one seat, for every 20 children using them. One or more seats shall be 10 inches high, the rest 16 inches.

Where there is danger of contaminating the well the vault shall be concrete, so constructed as to prevent leakage of sewage and so that it may be cleaned. Light from the outside shall be completely shut out of the vault. The vault shall be ventilated with a flue, with a cross-sectional area of not less than 64 square inches and extending from the vault through the roof. One of the chief aims is to shut out flies, which spread contagious diseases.

No. 42. All toilets shall be kept clean and the walls free from objectionable language or pictures.



Antiseptic Tank or Chemical System for One-room-Schools.

SUGGESTIONS REGARDING TOILETS.

There are a great many different forms of furnishings for indoor toilets. The following points should receive careful attention:

WHEN WATER PRESSURE AND SEWERS ARE USED.

1. The surface exposed to soil should be porcelain or fire enamel. Even these require constant cleaning by the janitor.
 2. Each seat should flush independently and automatically.
 3. The most satisfactory seats and urinals are those which provide for a current of air from them into a ventilating shaft.
 4. The room should also be provided with a ventilator at the top of the room.
 5. Air should be admitted from the outside in such a way as not to blow in for this tends to carry the air from the toilet room into other parts of the building. This may be accomplished by placing under the window sash a frame covered with cheesecloth. This admits air but prevents a strong current.
 6. The floor and walls should be of a material which will not absorb water or moisture.
 7. The urinal is the source of most objectionable features. It is very difficult to prevent the presence of odors. If a sufficient number of seats can be constructed that the seats, when not in use, rise to a perpendicular position and expose the bowl, it is advisable to dispense with the urinals.
- When antiseptic or chemical tanks are used the provisions mentioned in the foregoing also apply.

INDOOR TOILETS FOR ONE-ROOM SCHOOLS.

There are many objections to toilets separate from the school building, even when the best provisions are made for decency and health. The antiseptic or chemical tank which provides for drainage, makes it possible to remove all these objections.

When a new house is built, room for toilets may be provided connecting with the cloak room. When old buildings are in use, an addition may be built to the house which provides entrances from the schoolroom. The cost will not be materially more than it is for building two outhouses and concrete walks to them.

Many of these have been used during the last 10 years. So far as we have been able to learn they are very satisfactory.

The only fault to be found is with the urinal in the boys' toilet. Too much attention is required to keep it clean. It is not necessary and should not be installed. It has also been found that cheap imitations have been sold at the same price as the good one. The enameling has been found to be badly cracked in a few months. Before purchasing directors should be sure that the material is durable. Porcelain bowls only should be purchased.

It is not safe to purchase a chemical toilet from any factory or dealer who does not belong to the Association of Chemical Toilet Manufacturers. This is an organization composed of firms that have agreed to install only toilets which meet every requirement.

BOYS' CLOSET.

Experience has abundantly proved that if the boys are given a chance their closet will be kept reasonably clean. When the seats only are provided it is impossible to keep them clean. When the urinal is in the same room as the seats more care to keep the place clean is required than boys are likely to take. When the urinal is outside very few go into the building, and it is kept clean.

The urinal trough should not drain into a water-tight vault. A separate underground receptacle can be provided.

WATER-TIGHT VAULTS.

Water-tight vaults are necessary when there is danger of polluting the well. The vault, in most cases, will not need to be emptied except just before the opening of school in the fall. The contents will then be dry and the work of its removal will not be disagreeable.

KEEPING OUT FLIES.

There is no greater source of disease than privy vaults exposed to flies. In parts of the State where the hardpan is near the surface and drainage is impossible, schoolhouses and even home privies have no vaults at all. There, also, typhoid fever is always present and often becomes epidemic.

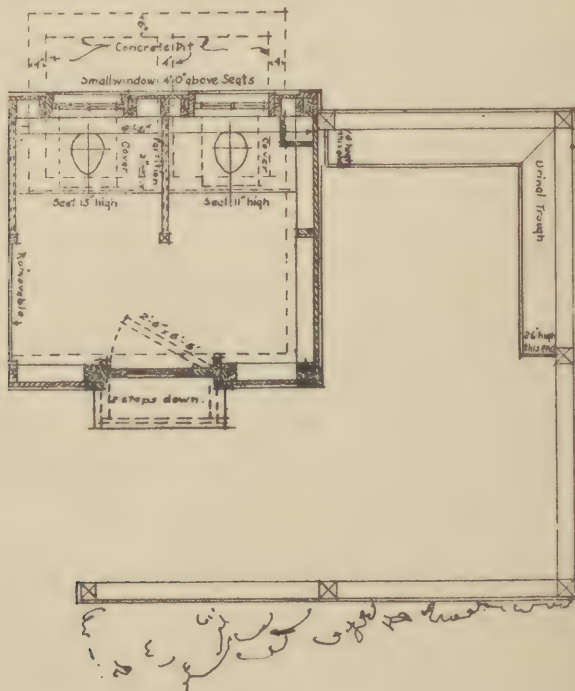
Properly constructed vaults will make it possible to completely shut out flies, and so prevent them from carrying disease germs to the food of the children. Typhoid fever will then be as rare as it is in parts of the State where drainage is possible.

VENT FLUE.

The vent flue is a necessity. If the vault is tight enough to exclude flies and the seat openings closed, there will be, while the closet is in use, a draft of air out of the vault through the vent flue, securing the wholesomeness of the room.

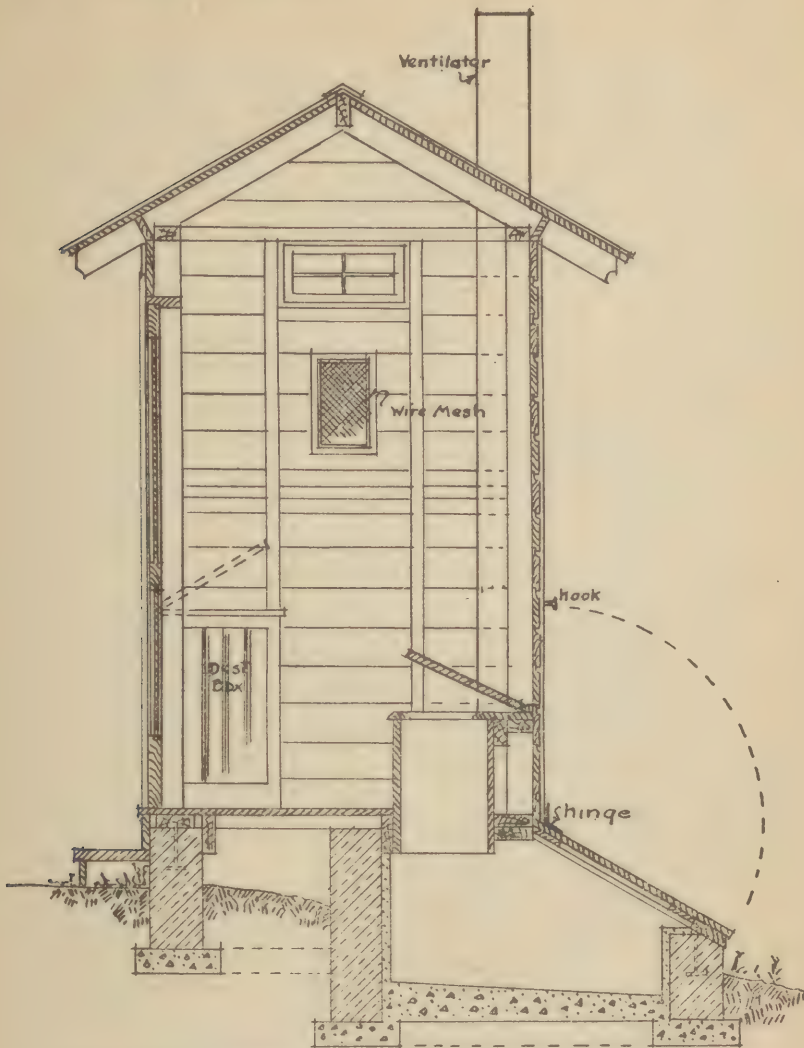
PLAN FOR OUTDOOR TOILET.

The plan offered and the bill of materials are for a larger house than is generally required in country districts. When the school is small a house 5 by 6 feet is large enough.



Floor Plan for outdoor toilet for boys. The girls toilet needs a screen only in front of the door. The dimensions are 5 by 6 feet.

A water-tight vault is strongly recommended. No other should be used except when the character of the soil affords good drainage and when there is absolutely no danger that a well will be contaminated. When possible, deep vaults should be drained.



End Elevation showing manner of constructing water tight vault which can be cleaned and is fly proof.

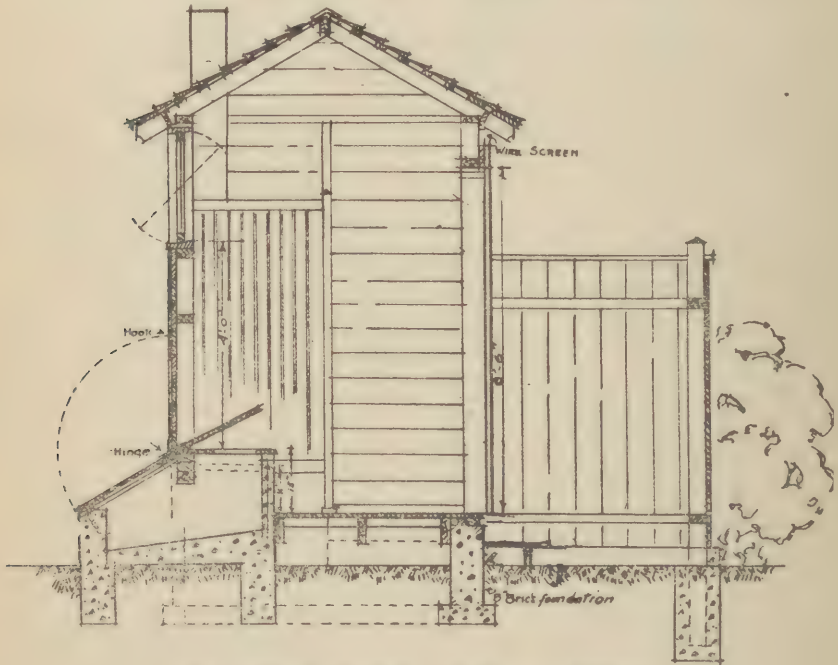
BILL OF MATERIALS FOR BOYS' CLOSET.

Shingles, 4 bundles.	Matched siding, 220 sq. ft.
Rafters, 5, 2"x4"x14'.	Unmatched, 70 sq. ft.
Ridge, 1, 2"x4"x10'.	Fence (matched lumber) 150 sq. ft.
Plate, 2, 2"x4"x16'.	Floor (toilet matched lumber), 50 sq. ft.
Wall Plate, 1, 2"x6"x12'.	Partition, 30 sq. ft. $\frac{7}{8}$ T. & G.
Studes, etc., 16, 2"x4"x16'.	Urinal trough, 2, 1"x12"x12'.
Joists, 2, 2"x8"x10'; 1, 2"x8"x14'.	Ventilator, 2, 1"x8"x10'.
Fence posts 3, 4"x4"x16'.	
Stringer, 5, 2"x4"x10'; 1, 2"x2"x16'.	

MILL WORK.

2 seats and lids.	Concrete, 5 cu. yds.
2 windows and frames (glass 18"x24").	Nails.
2 windows and frames (glass 18"x24").	Paint.
1 door and frame (2'6"x6'x6").	

This is for a house 10 by 6 ft.—For ordinary size 6 by 5 ft. less material is required. The builder can estimate the quantity needed.



End Elevation showing manner of screening.

SAFETY AGAINST FIRE.

THE LAW.

An Act to regulate the egress from public buildings provides that the doors to the entrance of school buildings shall be so hinged as to open outward.

An Act relating to fire escapes provides that in school buildings of more than two stories, at least one fire escape shall be provided, and that in halls above the ground floors as many fire escapes shall be provided as the corporate authorities may direct.

MINIMUM REQUIREMENTS

No. 43. *New or Remodeled Buildings.*—In school buildings hereafter erected boilers shall be placed in fireproof rooms.

No. 44. In buildings more than one story high boilers or furnaces shall not be placed under a stairway or corridor through which the pupils pass in leaving the building.

No. 45. Outside doors within 20 feet of stairways shall be provided with an appliance which will cause the door or doors to swing outward when pressure is applied.

No. 46. Smoke flues shall be lined with a good quality of chimney lining or so constructed that should the mortar between the bricks fall out, fire can not escape through the opening.

No. 47. The stairway from the grade level to the first floor should not be less than 6 feet wide. The stairway from the first to the second floor should not be less than five feet wide. If there are two stairways used at the same time, these may be four feet wide. The number of rooms in the building must be taken into consideration.

No. 48. All air ducts or ventilating shafts shall be of metal or fireproof material.

Buildings Already in Use.—If the county superintendent of schools finds any hazardous conditions he should call the attention of the school board to them. If, in his judgment, these are decidedly dangerous for the safety of the children, and if the school authorities do not remedy the defect, he shall enforce the law by first calling for an inspection by the State Fire Marshal.

SANITARY INSPECTION.

OF

District No.....County

.....Co. Supt.

Date192....

The numbers before the topics in this sheet are the same as the number of the requirements in this section beginning on page 8. For a detailed explanation for each item the reader is asked to read these requirements and the suggestions which follow.

The county superintendent should record his inspection on this sheet and deliver this pamphlet to the clerk or secretary of the board of a district where schools do not meet the requirements and should keep a copy for his office files. Check sheets separate from the pamphlet, will be furnished for this purpose, on application to the Superintendent of Public Instruction.

Boards of directors or boards of education should, upon receipt of this record of inspection, confer with the county superintendent at their convenience about the improvements to be made as is required by law.

SANITATION INSPECTION RECORD

District No.....

Building.....

Upon careful inspection I note the following conditions and make these suggestions:

[illegible]

SUGGESTIONS TO DIRECTORS.

SECTION II. SCHOOLHOUSES.

ONE-ROOM SCHOOLHOUSES.

The schools are never good enough. As society improves, the schools become inadequate and must be improved. The good school for yesterday is a poor school for today. Many of the one-room schoolhouses will be replaced by new ones within a very few years. It should be the aim of all to make these as good as possible. They will remain fifty or sixty years. It costs no more to erect a house well suited to the purpose than to build one of the old type. The plans and specifications herewith presented were prepared by a competent architect with the assistance of those who have had long experience in country school work.

Two hundred or more of these houses have been built in the last few years. The outside is not always the same and this is not essential. The lighting, cloakrooms, fuel room, porch and entry, heating, ventilation, and seating should be strictly followed. Some have thought to improve the plan by placing doors from the entry to the cloakrooms. This makes proper conduct on the part of the children much more difficult and gives the teacher much more trouble.

The directors are required by law to consult the county superintendent when they decide to erect or improve a schoolhouse. Failure to do this subjects the district to the loss of the state school fund.

PLAN FOR A GOOD ONE-ROOM SCHOOLHOUSE.

In planning the one-room school building herein described great care has been taken to meet all the requirements of a comfortable, sanitary, convenient school home for the children. The architect has succeeded in devising an exterior which is most pleasing. It suggests a home as well as a school. A number of houses have been built after this plan and they are fully up to expectation. The house can be built of wood, brick, or concrete blocks.

The specifications found on another page are for a house of wood. The outside dimensions are 32 by 33½ feet. The schoolroom is 23 by 31 feet. The library room is 8 by 9 feet. One cloakroom is 4½ by 9 feet and one 6 by 9 feet, and the vestibule 6 by 9 feet.

The vestibule is intended for entrance only. There are to be no hooks on the walls. A wire mat should be on the porch and in the vestibule a large foot mat. These will prevent carrying dirt into the schoolroom. Double doors should be placed both inside and out and the upper half of both sets should be of glass with substantial wire screening, that the teacher may see what is going on in the vestibule.

THE COAT ROOMS.

Separate coat rooms for boys and girls are essential. Girls especially need a place where they may be safe from molestation. Above the door there should be a transom which should be open at all times and the door should not reach the floor within four inches. This will insure heating and ventilation of the coat rooms. In each of these should be shelves where the lunch pails may be kept. Coat hooks should be strong and well fastened to the wall. No entrance should be placed between the vestibule and the coat rooms. The only entrance to the coat rooms should be in view of the teacher. This arrangement greatly lessens the difficulty in discipline.

The doors to the toilets should be of matched lumber. The top five feet from the floor. When toilets are not installed, the space serves as a storage closet.

PLAN FOR SEATING.

In the floor plan on page 72 the middle row should be No. 6's, the row to the left No. 5's and to the left of that No. 4's, to the right of the row of No. 6's should be No. 3's, and to the right of this No. 2's. This arrangement brings the little ones near to the teacher where she can easily look after their needs. It separates the advanced from the intermediate pupils, a very desirable condition.

The seats should be in line in front, but need not be so in the rear.

Two 7-foot benches and the front seats afford enough recitation seats. They should be so placed that pupils and teacher may pass between them.

There should be no platform for the teacher's desk. It is of no use whatever, is in everybody's way and is a great draft on the teacher's energy.

THE FUEL ROOM.

It is a great hardship for women teachers to have to carry coal from a distant part of the yard. The fuel house very frequently does not protect the contents from rain and snow. The fuel room should have a concrete floor. The door to the room should be close fitting so that dust does not enter when coal is being placed in the fuel room. Both outside and inside doors should be protected by planks which can be placed as the bin fills up and can be removed when they are not needed. This room should be lined with heavy lumber, behind which should be building paper, so that dust may not escape.

When building a new house the cost of this room is much less than a separate coalhouse and the convenience of it is worth much.

Experience has shown that objections against having the fuel room connected with the building are groundless. All who have tried it say it is a great improvement. When a basement is provided, this space is used for entrances.

THE SCHOOLROOM.

The schoolroom is 23 by 31 feet and the ceiling is 13 feet high. It will seat comfortably 45 pupils. The floor plan shows 30 desks and 5 backs, seating 30 pupils. Two more rows may be placed in the rear and one in front, making 45 desks. Every door is within plain view of the teacher, as is the playground at the rear of the building. The house may be built larger and improve its appearance.

TINTING THE WALLS.

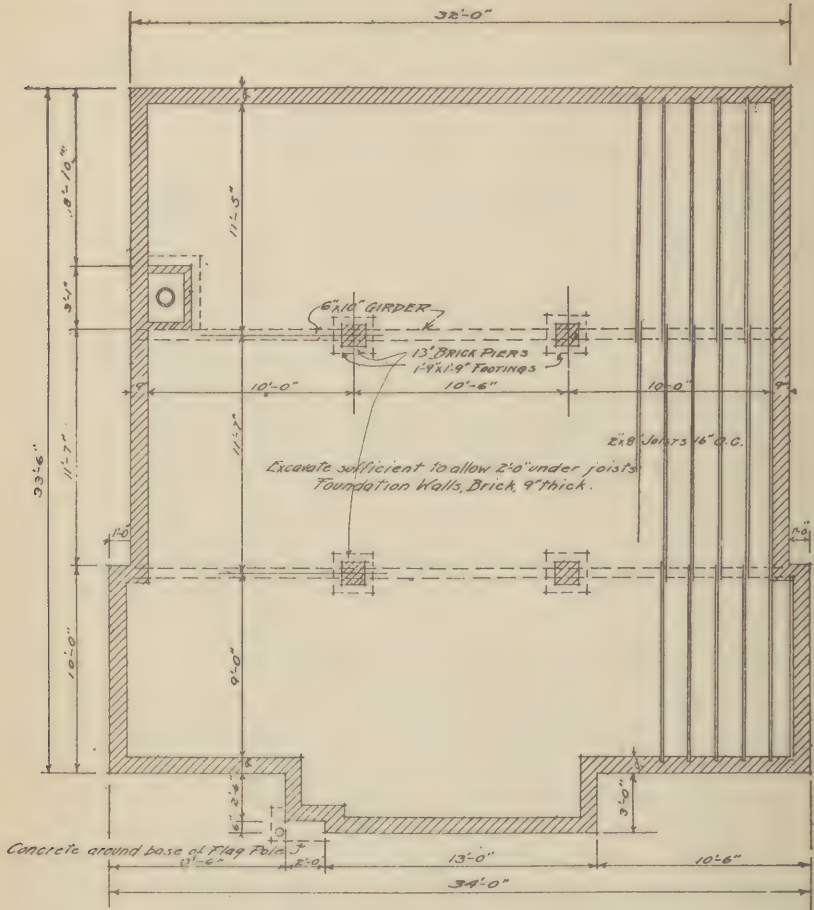
The walls of a schoolroom should be tinted so as to afford the children the best light and in such colors as are most restful to the eyes. To tint all the surfaces, ceiling and walls the same color is always bad, especially if the color is dark. It makes the room look like a cave. Paper should not be placed on new walls. It will not stay on and is insanitary. Alabastine or a similar preparation is the best. It is inexpensive, any one can apply it and it will stay. The proper colors can be easily obtained. Two schemes are recommended, one in gray and one in tan. The wainscoting should be a chocolate brown, the walls up to the border should be a light gray. The border and ceiling should be a cream color.

When tan is the prevailing color the wainscoting should be brown, the walls tan, the border and ceiling a light cream. If paint is used, it should have no gloss.

The colors recommended give the room a homelike, cheerful look, and make the light more favorable than any other colors. A dark ceiling greatly darkens the room. It absorbs the light instead of spreading it over the room. When a room is ceiled with hard pine the walls may be left the natural color but the ceiling should be painted a light yellow.

THE LIGHTING.

When possible the light should come from the north or east. In this room it comes almost wholly from the left of the pupil. That which comes



FOUNDATION PLAN

from the rear is so high that it casts no shadow on the pupil's work. All windows (except north windows) should be provided with heavy white or light yellow tint shades.

Light should never be admitted from in front of the children. Even one window is very injurious.

BILL OF MATERIALS.

ILLINOIS DISTRICT SCHOOL.

Excavation—

Trench, 142'x2'x4'.
4 piers, 2'x2'x4'.

Chimney pier, 1'x4'x6'.
32'x35'x1'.

85 cu. yds.

Brickwork—

141.5' 9" wall, 5' deep.	6 yds. sand.
1 flue, 29"x21"x28' high.	5.5 bbl. lime.
4 piers, 13"x13"x5'.	5.5 bbl. cement

Flag Pole Base—

Concrete, 2"x2'x1'.	4 cu. ft.
---------------------	-----------

Chimney Cap—

Stone or concrete.

Ventilating Grates in Foundation—

5 vents, 6"x9", cast iron.

Flue Lining—

10" iron pipe or sewer tile, 28' high.

Woodwork—

Girders, 6 pcs., 6"x10"x12'.	Wall plates, 4 pcs., 2"x4"x18'.
Sills, 6 pcs., 2"x8"x20'.	Wall plates, 4 pcs., 2"x4"x12'.
Sills, 8 pcs., 2"x8"x16'.	Ceiling joists 25 pcs., 2"x6"x24'.
Floor joists, 59 pcs., 2"x8"x12'.	Ceiling joists, 34 pcs., 2"x4"x10'.
Floor joists, 13 pcs., 2"x8"x10'.	Rafters, 52 pcs., 2"x8"x16'.
Studs, 108 pcs., 2"x4"x14'.	Rafters, 26 pcs., 2"x4"x14'.
Wall plates, 8 pcs., 2"x4"x16'.	Rafters, 5 pcs., 2"x4"x16'.
For cripples, 40 studs, 2"x4"x12'.	
Roof sheathing, 1,100 sq. ft. 1"x4".	
Roof braces, 26 boards, 1"x4"x16'.	
Roof shingles 13,000.	
Boxing, 2,040'x1".	
Siding, 2,500'x4".	
Flooring, 1,450 ft., 1"x4".	
Cornice Plancier, 225 ft., 1"x4" wainscoting.	
Wainscoting, 860 sq. ft.	
Lining for fuel room, 250 sq. ft. flooring.	
Cornice crown mould, 234 ft. 4" wd.	
Finish lumber, base, corner-boards, frieze, ridge-boards and steps, 655 ft.	

Doors in Frames—

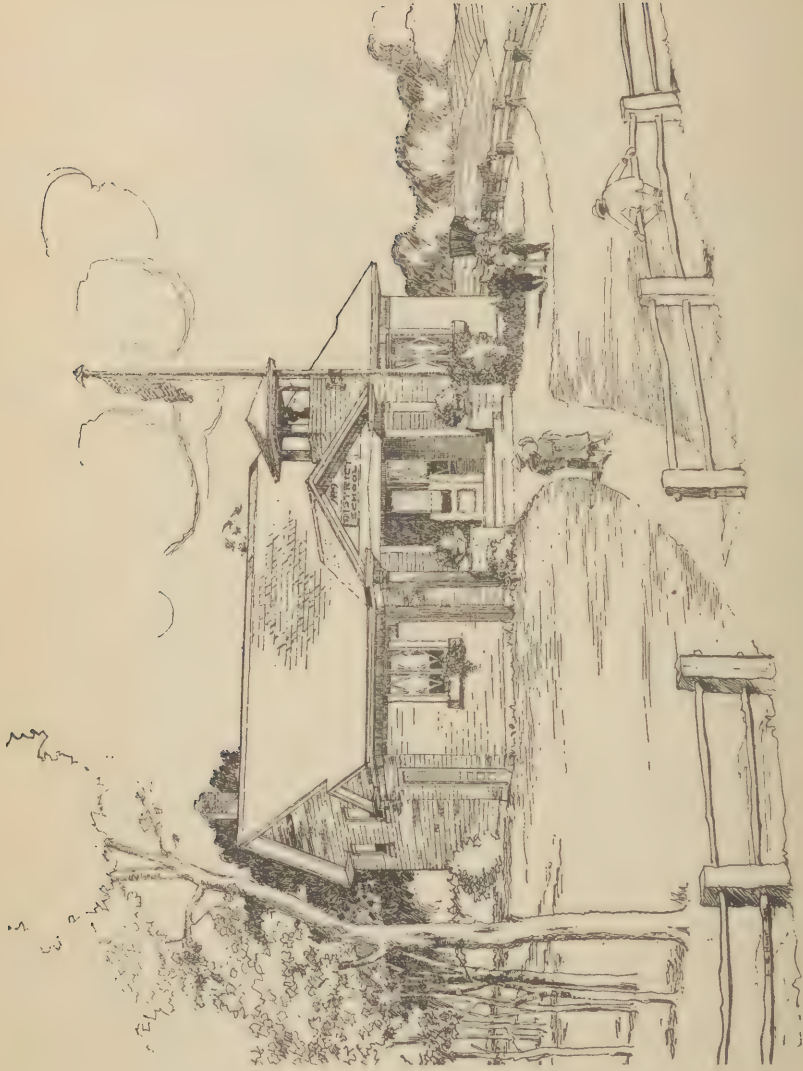
Outside double doors, 4'8"x7'x1 $\frac{3}{4}$ " G. P. Tr. 16", 5 lights.
Inside double doors, 4'8"x7'x1 $\frac{3}{4}$ " G. P. Tr. 16", 5 lights.
4 doors, 2'8"x7'x1 $\frac{3}{4}$ ".
1 door, 2'6"x7'x1 $\frac{3}{8}$ ".
1 door, 1'6"x7'x1 $\frac{3}{8}$ ".
Outside fuel door, 2'8"x7'x1 $\frac{3}{4}$ ".

Windows and frames—

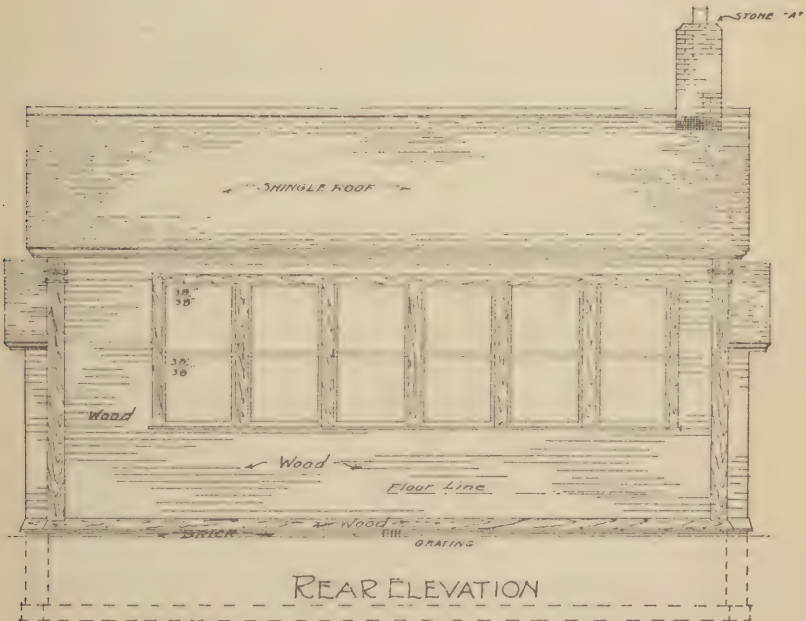
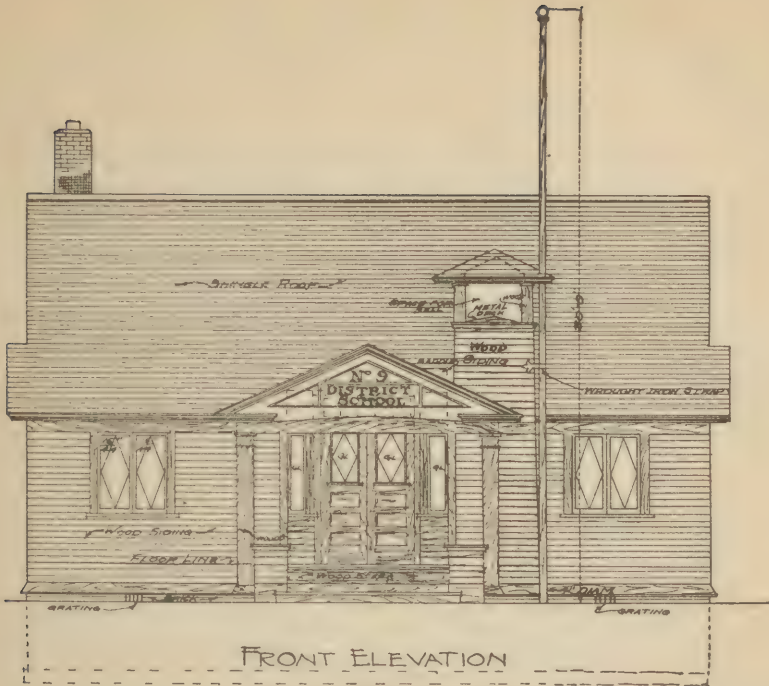
Group of 6 windows, box frames, 2 L. 38"x38".
2 windows, plain frames, 1 L. 32"x36".
2 windows, plain frames, double folding sash, 1 L. 16"x44" hinged outside.
2 windows, plain frames, single sash hinged outside, 1 L. 10"x44".
1 flag pole 30' long, 5"x5" and 3"x3", W. I. holder.
Lath, 5,100.

Plastering—

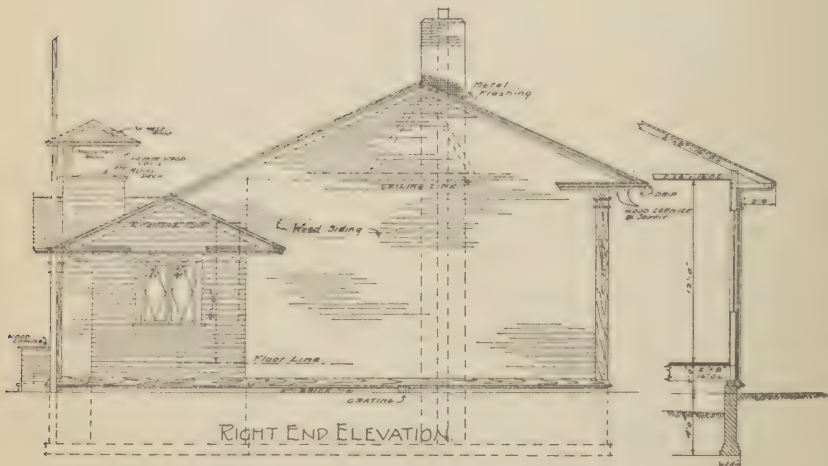
9 bbl. lime.
6 yds. sand.
15 bu. hair.
Sheet metal, hardware, painting, desks, paper hanging, decorating walls and ceiling, heater, ventilating register, fresh air duct, blackboards, walks.

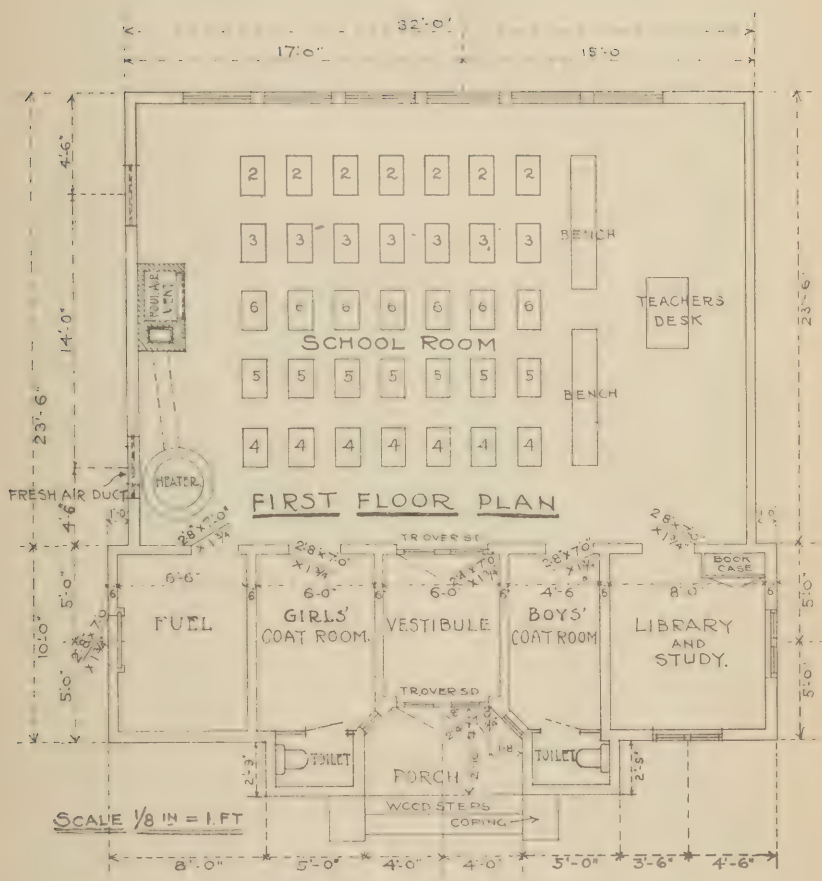


Perspective of Modern One-room Schoolhouse.

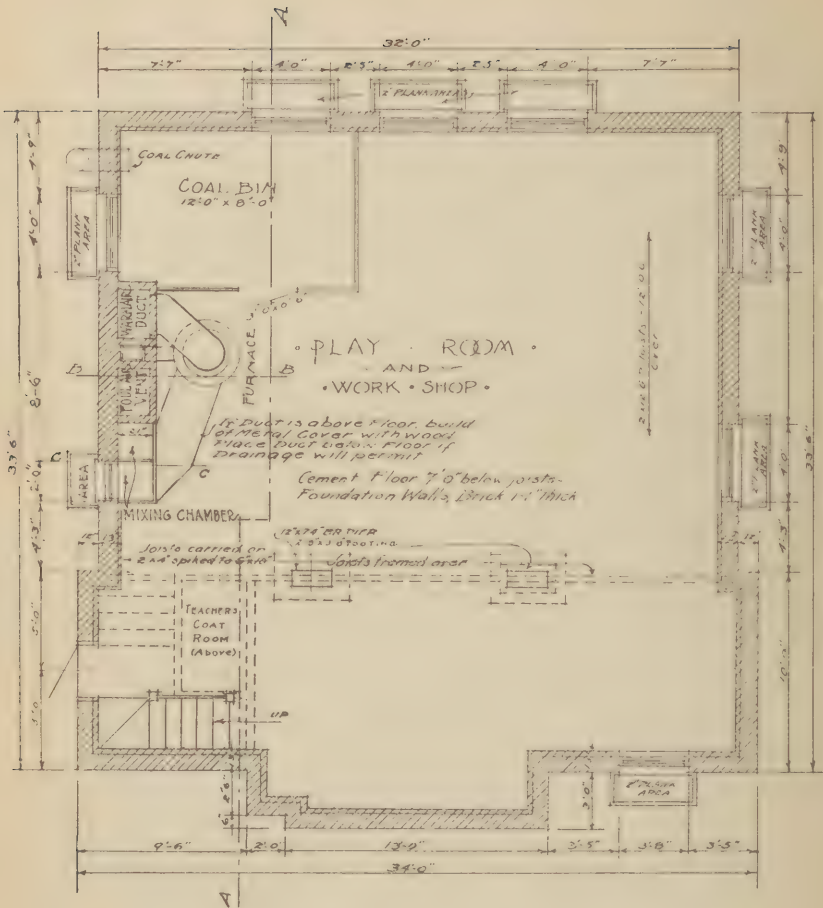


This side should be north, east or west if possible.





Floor Plan—Without Basement.



FOUNDATION PLAN -

Plan for a Basement.

For plan for installing Furnace. See pages 18-20-21.

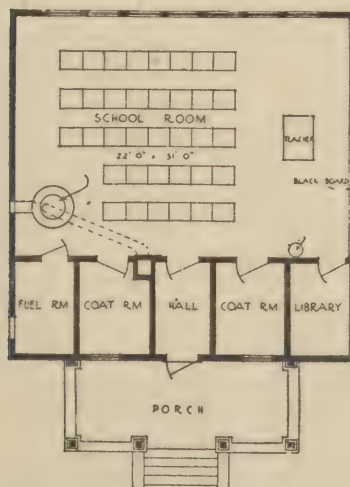
A LESS EXPENSIVE HOUSE.

In some districts the assessed value of the property is so low that it will be impossible to raise the money by taxation to build so expensive a house as the Illinois district school. For such, a less expensive plan is suggested: The foundation is 32 by 32 feet. The schoolroom is 22 by 31 feet. If the fuel room is not desired it can be used as a coat room and the library room can be made to include the present room and the coat room besides it.

It provides all the conveniences of the more expensive house, but is smaller and plain in appearance. The cost of building will be from \$1,200 to \$1,800, depending upon the price of material and labor in different localities.



A Less Expensive House—Perspective.



A Less Expensive House—Floor Plan.

REPAIRING AND IMPROVING OLD BUILDINGS.

Most of the country schoolhouses built forty years ago are usually of the type shown in figure 1. The timbers are still sound and districts do not like to discard the old and build new houses. A house of this type can be repaired and improved at small cost. The house then will be good for a generation.

Figure 1 shows the schoolhouse that is found in many places. It has no vestibule nor coat rooms. There are windows on both sides and often at the ends, sometimes the windows are on four sides, making it impossible for a child to sit without facing the light. This is useless and injurious to the children. The desks are double.

The improvement suggested does away with the platform and the double desks. It provides a vestibule and two coat rooms in front, a fuel room and library at the side. The lighting is from the left and the rear and is perfect.

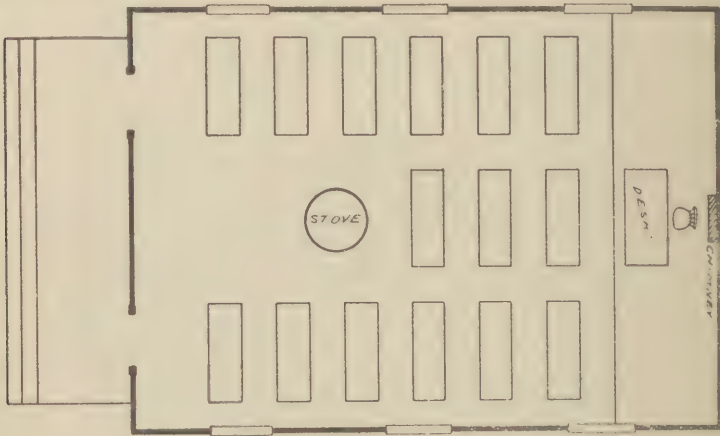


Fig. 1.

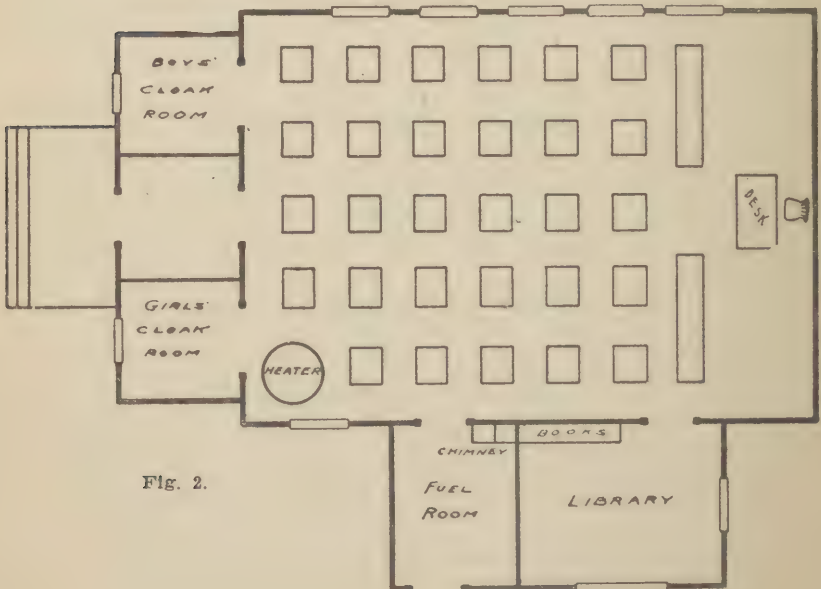
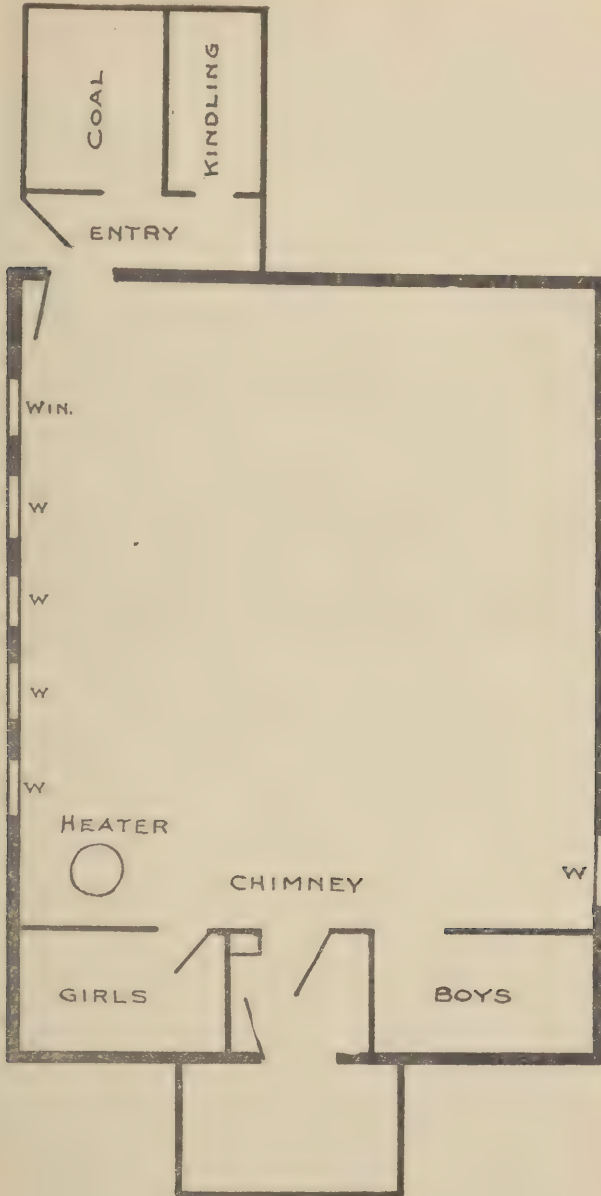


Fig. 2.

The library and fuel room can be placed similar to that in the cheaper plan of the Illinois district school and the lighting arranged in the same way.

In repairing old buildings a good foundation should be provided. The ventilators in the walls should be closed in winter. It will save a ton of coal and add greatly to the comfort of the children.



INEXPENSIVE CLOAKROOMS, ENTRY, AND FUEL HOUSE.

Many country schoolhouses consist of four walls only, the door opens directly into the school room and the children's wraps are hung on the wall.

Such a house can be made fairly comfortable by erecting matched ceiling partitions as shown above. The walls enclosing the entry should extend to the ceiling, but the cloakroom walls should extend upward only $6\frac{1}{2}$ feet. They should be raised 6 inches from the floor so as to allow the air to circulate freely. The double chimney should be placed in the entry and the heater in one of the corners or near the cloakroom.



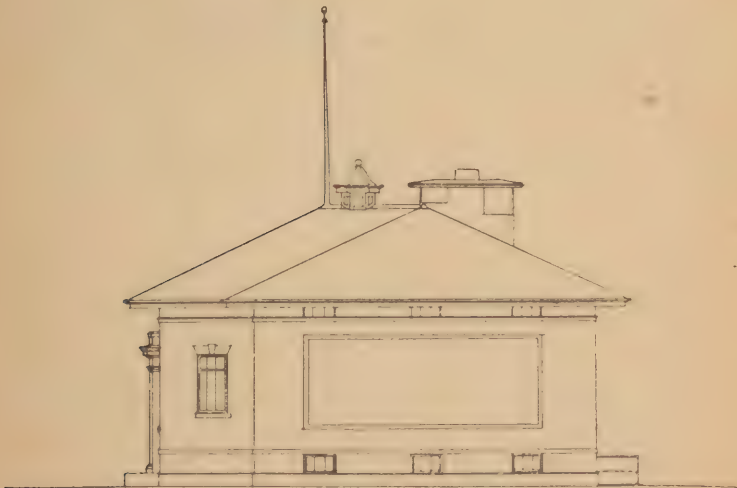
A LIBRARY ROOM.

Such a room and good usable books if rightly used will double the value of a one-teacher school.

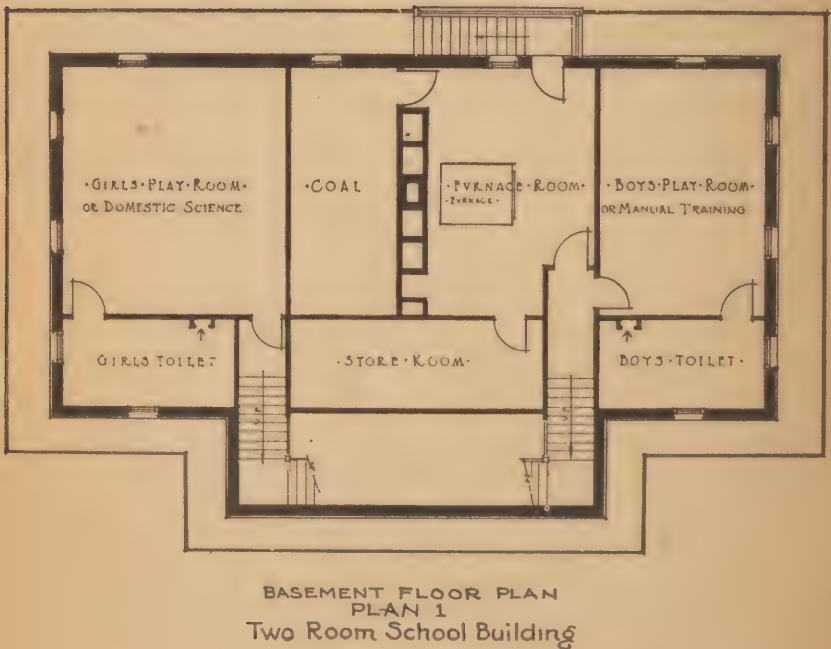
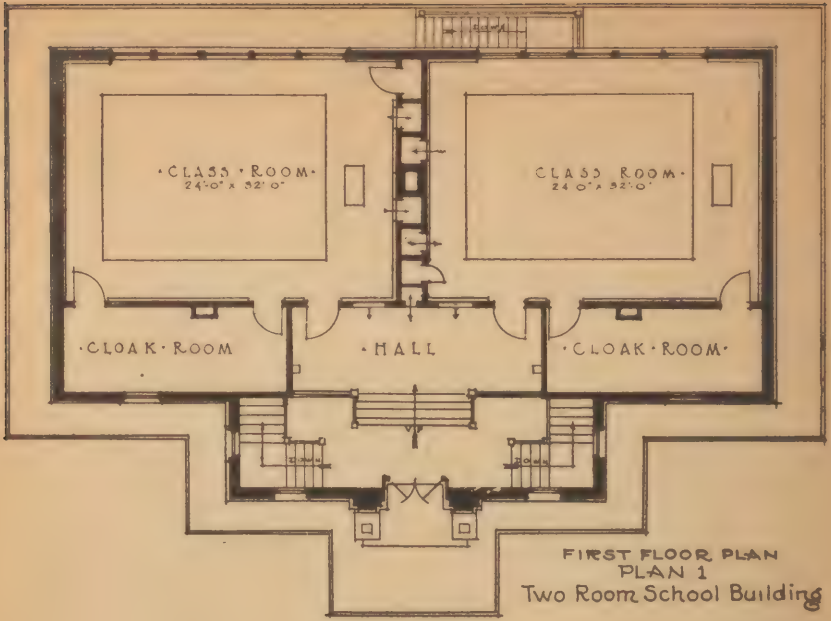
PLANS FOR PARTIALLY GRADED SCHOOLHOUSES.



FRONT ELEVATION
PLAN 1
Two Room School Building



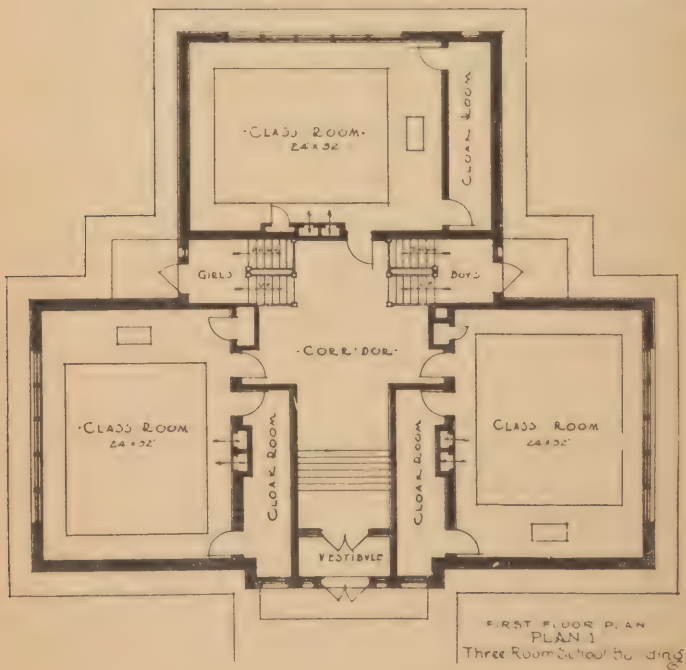
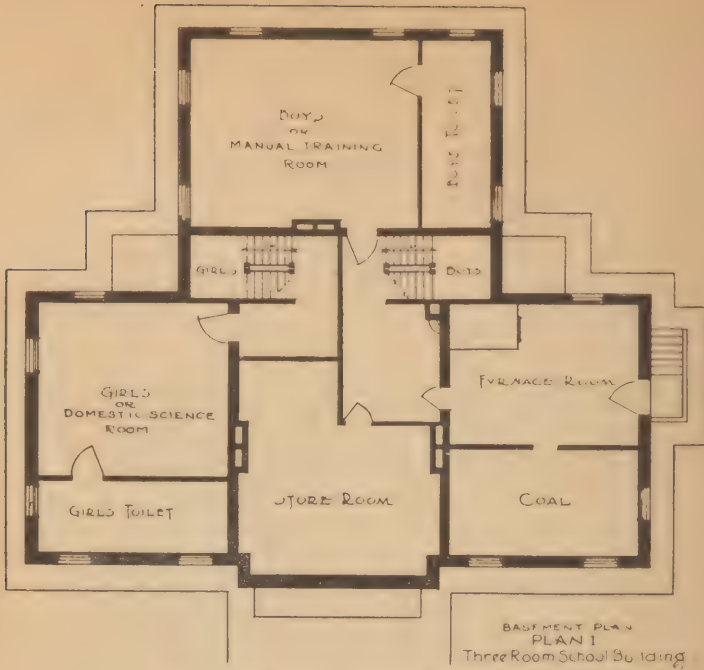
SIDE ELEVATION
PLAN 1
Two Room School Building



PLAN 1.



Three-Room Schoolhouses.



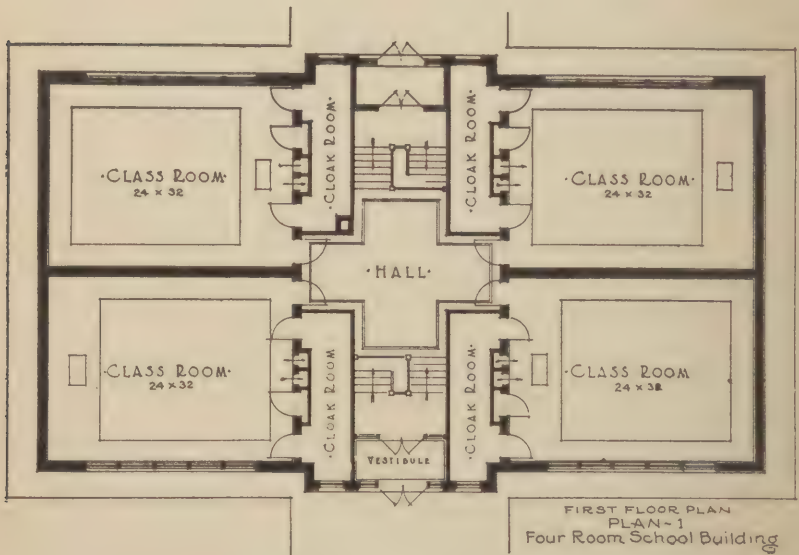
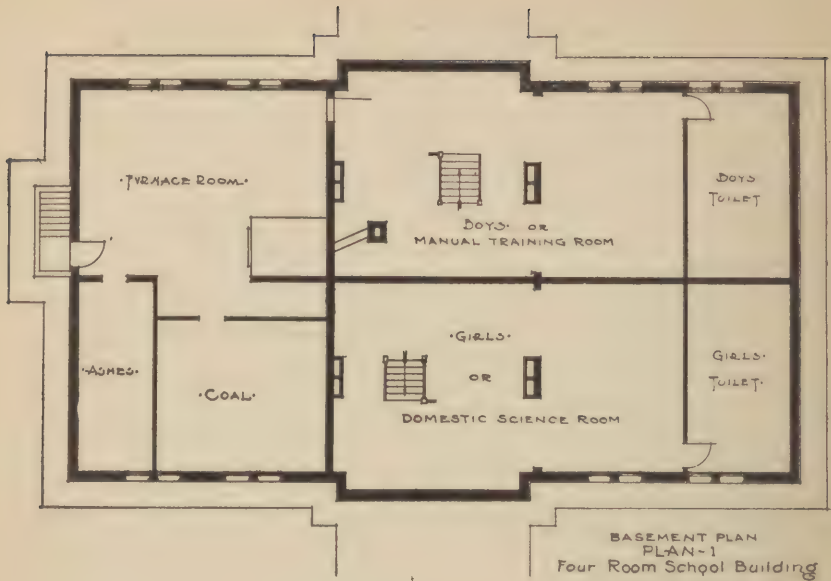


FRONT ELEVATION
PLAN-1
Four Room School Building



SIDE ELEVATION
PLAN-1
Four Room School Building

SIDE ELEVATION



SECTION III. STANDARD SCHOOLS.

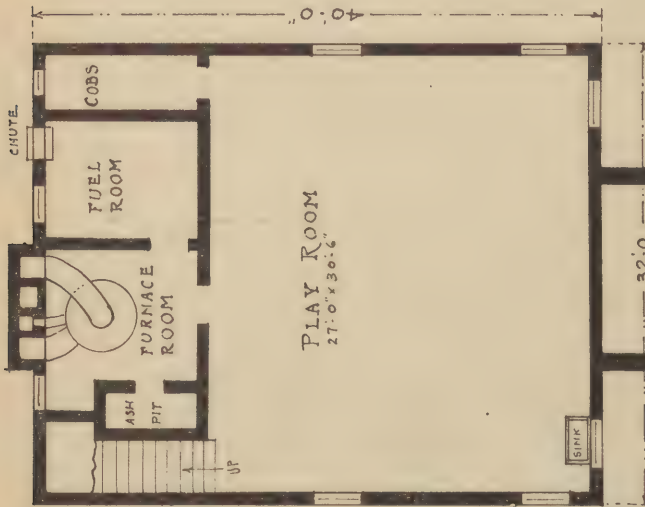
The State Superintendent of Public Instruction will recognize as a standard school and will award a diploma and marker to schools which meet the requirements set forth herein. The diploma is an attractive document which can be framed and hung on the walls of the schoolroom. The marker is a plate four by twenty-four inches bearing in gilt letters the legend STANDARD SCHOOL suitable for placing above the door on the outside.

The purpose is to give a definite and an attainable aim for directors, teachers, and pupils. To attain this aim is evidence that the best has been done by the community to give its children a fair chance for the benefits of a good school. To know just what needs to be done to make a good school possible is often not an easy matter for those who have not made a study of the problem. In the provisions set forth, the essentials are made definite and the directors and the patrons can be assured that no money is squandered in providing these things.

The method is for the county superintendent, the teacher and the directors, and the pupils as well, to determine that they mean to make the school worthy of recognition. Then provide the things called for and so organize and conduct the school. The county superintendent decides whether the conditions have been met. If they have, he recommends the school to the State Superintendent for recognition. But before the county superintendent undertakes to do this he should call on the state supervisors of rural schools to spend several days with him to inspect schools which claim to be up to standard. This will enable the county superintendent to clearly interpret the requirements, taking into consideration the various conditions and circumstances. The state supervisors will also be pleased to meet school officers individually or in meetings to confer with them about the best interests of the schools. When a school is inspected for standardization either by the state supervisor or the county superintendent, the directors should be present that the occasion may be most helpful to all concerned.



Zollars superior school, Logan County.



BASEMENT PLAN



FIRST FLOOR PLAN

Zollars School.

ONE-ROOM SCHOOLS.

REQUIREMENTS FOR STANDARDIZATION.

SANITARY CONDITIONS.

In heating, ventilation, lighting, seating, water supply, toilets and safety against fire, the schoolhouse and equipment must meet the requirements of the law, as set forth in Section I.

THE YARD.

1. Ample playground.
2. Good approaches to door and outhouses.
3. Convenient and serviceable fuel house.

THE SCHOOLHOUSE.

4. House well built, in good repair, including paint.
5. Good tight foundation.
6. Attractive interior decorations.
7. Clean floors, walls and furniture.
8. Good blackboards, some suitable for small children.
9. Two good cloakrooms. The one for girls should have one entrance only and that from schoolroom with a bench which can be used as a lounge.

FURNISHINGS AND SUPPLIES.

10. Two good pictures. (See State Course.)
11. Good teacher's desk.
12. Good bookcase.
13. Good collection of juvenile books suitable as aids to school work as well as general reading.
14. Set of good up-to-date maps.
15. Good globe.
16. Suitable dictionaries.
17. Thermometer.

SCHOOL ORGANIZATION.

18. School classified to do the work of the State Course of Study.
19. Classification and daily register well kept.
20. Definite program of study.
21. Program of recitation.
22. Pupils' reading circle, organized and being done.
23. At least seven months' continuous term.
24. Attendance regular.
25. Discipline: Instruction and spirit of the school good.

THE TEACHER.

26. Education: Equivalent of a high school course.
27. Salary not less than \$80.00 per month.
28. Ranked by the county superintendent as a good or superior teacher in a scale of poor, fair, good, superior.
29. Must meet the county superintendent's requirements for professional interest and growth.

For greater detail read the following. The number of topics are the same.

STANDARD SCHOOL

SUGGESTIONS IN DETAIL.

THE YARD.

1. The playground should not be less than one-half acre. It should consist principally of an open level space. The trees and shrubbery should be around the border of the lot. It should be well drained so that water will not collect in low places.

2. There should be a concrete walk from the schoolhouse door to the gate and to the well. Concrete walks to the toilets are not required except where water or mud makes them necessary.

3. The coal house should be attached to the schoolhouse and entered from the schoolroom. When this is not feasible it should be near the schoolhouse but not in front of it where it spoils the looks of the premises. It should be so built and painted as not to detract from the attractiveness of the house and grounds.

THE HOUSE.

4. The house must be in good repair on the outside, well and attractively painted.

5. There must be a good foundation that will help to keep the floor warm in cold weather. The only holes in it should be those intended for the ventilation under the floor and these should be closed in cold weather. Newspapers stuffed into the openings will close them effectively.

6. The interior should be properly decorated as specified under "Tinting the Walls." If the walls are papered, a plain paper should be used, never a dark color nor a figured paper. When paint is used a "flat paint," not a glossy one, should be used.

7. When sweeping, a preparation should be used which prevents the dust from rising. When dusting, a cloth moistened with water or oil should be used. Dust must not be allowed to settle on the furniture nor in the corners of the room and the halls. When desks have become soiled and marred, the tops should be planed, revarnished or cleaned as may appear most feasible.

8. Blackboard should be, preferably, of slate, though other good material may be used. Some of the blackboard should reach within 26 inches of the floor for the use of the small children.

9. It is not well that 30 children should live six hours each day in one room, with no place where there may be privacy for the girls. To have the shoes and clothing in the same room is not conducive to training in habits of housekeeping. The vestibule as a place for the clothing is objectionable in many ways. When a new house is built there is no reason why two separate cloakrooms may not be provided. In old buildings it is usually easy to provide cloak rooms.

FURNISHINGS AND SUPPLIES.

10. There should be two good pictures adapted to schools. These should be worthy of a good frame and glass. Advertisements and trashy pictures should find no place on schoolroom walls.

11. The teachers' desks should contain compartments which can be locked and one of them should be suitable to contain records.

12. The best bookcases for schools are those known as sectional cases. As many sections as are needed may be bought and another may be added when needed. Too often the bookcase is the receptacle for all kinds of use-

less material. It should contain books only and they should be systematically and tastefully arranged.

13. The books should be selected with three objects in view: First, to secure books which are suited to the age and advancement of the pupils; some for every grade. They should be interesting and have a wholesome influence upon the reader. Second, books which are supplemental to the school studies, books on geography, history, nature study and classical juvenile literature. Third, books of reference, such as a good set of encyclopedias written especially for school use. The encyclopedias of many volumes written for scholars should not be bought except for high schools.

14. The maps should be modern. Those more than ten years old are of little value. Every school should have a map of the United States, of the State, and of the continents.

15. A good 12- or 16-inch suspended globe, together with the maps found in the geography and history texts, and those recommended in 14, make a good working outfit.

16. Better service will be obtained from two or more copies each of two grades of dictionaries—common and high school grades—than from the large edition costing about \$16. Besides those for common use, each pupil should have his own dictionary suitable to his advancement.

17. A thermometer is essential. The sensations of the teacher can not be depended upon to regulate the temperature. She may be very warmly dressed and keep the room too cool for the children. She may be so thinly dressed that the room will be kept too warm for the children. The thermometer should be hung as near the floor as the shoulders of the seated children and the temperature maintained at from 68 to 72 degrees.

SCHOOL ORGANIZATION.

18. The one-room school, containing as it does pupils of all ages and all stages of advancement, must be organized into a harmonious working body. Organization requires the grouping of pupils, the allotment of time, the assignment of duties so that both pupil and teacher may work to the best advantage.

The State Course of Study provides the plan of organization. It divides the work of the course into eight years, or grades, and each grade into classes. If all classes of the eight grades were present the divisions would be so numerous that the teacher could not do justice to all.

The most successful scheme to secure fewer classes and yet do the least injustice to any is known as alternation. The work is so arranged that two grades may work together doing the allotted work of two years. But the year's work is done in the reverse order from the year before. In this way the classes required for three years of the course are dropped out, with little detriment to the children. The State Course of Study contains a detailed statement of the plan of alternation.

19. If the school is actually organized a record of that organization can be easily made. The record also serves a good purpose in this, that it gives the teacher a clearer idea of just what the organization is. There are two forms which are in general use which answer the purpose well. If the record is complete, it is not only a history of what has been done, it is such a description of the school that a new teacher can take up the work where the former teacher left off. By this means a school once started does not end. Vacations come, but the school exists and goes on.

20. There should be a definite time for a class to prepare its lessons. Such a program is outlined in the State Course of Study. Not to have a definite time to prepare each lesson will give the teacher endless trouble. If the pupil is kept at work at his desk, the problem of discipline during school hours will be solved.

21. Care should be taken to properly divide the time for recitation. Some recitations require less time than others. The State Course of Study contains a sample program.

22. The first aim of the school is to give proficiency in the school arts. The child should learn to read, to write, to spell, and to figure, to speak and write the English language effectively, and to secure a fair knowledge of the world in which he lives and of the history of his country. It is the first duty of the teacher to see that these things are well learned. The habits of continuous application and accuracy formed by doing this work well will be quite as useful as will be the knowledge gained. This hard and sometimes irksome work must be done or the school is not the greatest success possible.

But the child's progress in knowledge gained from books depends upon a ground work of ideas. Unless he has these ideas and the words to express them, his mind is up against a wall. To understand what is told him by the teacher or the book is almost impossible. Because he does not get on in his books, he is considered stupid. Many a child starts to school familiar only with a hundred words and the ideas which they express. These have served his purpose in the intercourse of his humble home. Others who come from cultured families have a vocabulary of four or five hundred words. They are considered gifted children because they understand so readily and have such interesting thoughts. Yet the child from the uncultured home may have the better mentality. The task of the teacher is to give the children ideas and the words to express them. When they reach the fourth grade they are expected to get their ideas and words largely from the texts which they study. The children not brought up in an intellectual home find this interpretation of the book very difficult.

The child has learned how to read when he reaches the last quarter of the first grade. If now he is supplied with interesting books, nine-tenths of the words are familiar to him; he will get the other tenth without difficulty. He advances to a more advanced book. This, too, he understands and adds ten or twenty per cent to his stock of words. If this is kept up by the time he reaches the fifth and sixth grade, he will have no difficulty in interpreting his textbooks.

The knowledge and the skill obtained from the mastery of the school subjects constitute the elements of an efficient mental equipment. They are the tools with which the pupil can work out a successful career. They are, however, of little value unless a good use is made of them and the disposition to use them is established. In addition to giving the pupil a mastery of the school subjects, the school should exert a strong influence in creating in the pupil a good point of view, a right attitude towards life and its work.

Probably the strongest influence that can be brought to bear upon the child to turn his thoughts and purposes to the living of a right life is found in the reading of good books. Through reading he becomes interested in what has been done and what may be done to make life better. His aspirations are awakened, his ambition aroused, and he seeks to realize in his own life work and conduct the things in which he has become interested. Good books become his teachers and have the same influence upon the growth of his character that does the companionship of worthy people.

THE ILLINOIS PUPILS' READING CIRCLE.

To make it possible for the schools to get the necessary books at the lowest cost in the easiest way the Illinois Pupils' Reading circle was organized by the State Teachers' Association twenty-five years ago. Publishers submit their books for adoption. From these are selected each year thirty of the most suitable books and over three hundred titles are kept on hand. Thus the best books from numerous publishers may be ordered and delivered by parcel post in a few days.

D. F. Nickols, Lincoln, Illinois, will give promptly any information desired.

THE LOAN OF BOOKS FREE OF CHARGE.

The State of Illinois will supply any school district with all the good books it can read. The only expense to the district is to pay the express or postage, usually less than \$1.

A collection of forty or fifty books may be kept a year or a part of a year and another set obtained.

Write for application cards and information. Address Illinois Library Extension Commission, State House, Springfield, Illinois.

23. To be a legal school the term must consist of at least seven months. To be considered a standard school this term must be continuous and taught by the same teacher, unless the change is made for cause. A five months' term taught by a well-paid teacher and a two-months' term taught by a poorly paid teacher can not be recognized as a seven months' continuous term.

24. The attendance must be regular, averaging at least 90 per cent.

25. The discipline and spirit of the school must be rated by the county superintendent as "good" or "superior" in a scale of fair, good, superior.

THE TEACHER.

26. Education: The teachers' schooling must be that afforded by a four-year course in a recognized high school. If not a graduate of such a school, successful experience for three years may be taken as the equivalent.

27. The salary of the teacher must be at least \$80 per month.

28. The teacher's character, skill and success must be ranked by the county superintendent as "good" or "superior" in the scale of poor, fair, good, superior.

29. Professional interest and growth must meet the requirements of the county superintendent for the renewal of certificates.

A SUPERIOR ONE-ROOM SCHOOL.

Many school officers have expressed themselves in favor of having not only the essentials of a good school, they want their school to be as nearly right as it can be made. To encourage this laudable desire a diploma is now offered to a superior one-room school.

A standard school is a good school having the necessary equipment and taught in a house which is well adapted to the purpose and in a sanitary condition.

A superior one-room school is one taught by a teacher of superior qualifications and with the highest efficiency, in a house that is as nearly perfect in all the essentials as possible and furnished with everything needed. The community must show the interest that the claim of such a school implies.



The Door Plate.

AWARDING THE DIPLOMA.

The awarding of this diploma should be made to serve to arouse the interest of the surrounding territory. It is suggested that all the schools, the school directors and the people within reach of the school be invited to be present, that a suitable program be provided to entertain the visitors. If desired, the Superintendent of Public Instruction will be present and award the diploma. Such an occasion should result in several standard and superior schools in the vicinity.

REQUIREMENTS FOR A SUPERIOR ONE-ROOM SCHOOL.

In addition to the requirements for a standard school a superior school must have the following:

1. At least one acre of schoolyard, neatly fenced, covered with a good sod and planted with trees, shrubs and flowers, concrete walks to the entrance and to the closets.
2. A well or cistern equipped with a sanitary drinking fountain within doors.
3. Besides the schoolroom, there shall be a basement, work and play-room, a cloakroom for each of the sexes and a library room.
4. The library shall contain at least 80 juvenile books, 10 suitable for each grade, a good school encyclopedia, suitable dictionaries and a supply of the bulletins published by the National Government and the University of Illinois useful in the school and in the community.
5. The pupils must be enrolled in the Illinois Pupils' Reading Circle and pursue the course of reading under the direction of the teacher and county superintendent.
6. A manual training bench and tools, equipment for sewing and for instruction in elementary agriculture. These subjects shall be taught to pupils prepared to receive such instruction.
7. There must be in operation a parent-teachers' club which secures the hearty cooperation of the parents with the school.
8. When the teacher under whose administration the school was recognized as "superior" ceases to teach the school, it must be reinspected to remain so recognized.
9. The teacher must hold a first grade elementary school certificate which is granted only to graduates of recognized normal schools or to those who have an equivalent preparation.

From the foregoing it is clear that before a school can be recognized as "superior" it must be taught in a house in every respect suitable to the best work, must be equipped with everything necessary, must be taught by a teacher of superior qualifications and skill, the course of study must be well done by the pupils, the people of the district must cooperate to make the school superior in every respect. The work of the teacher, the pupils and the patrons is of first importance, the house and equipment are secondary.

Before asking for inspection with a view to being recognized as a superior school, the school should be thoroughly inspected by the county superintendent to make sure that all the requirements have been met.

If in his judgment the school is up to requirements, he should arrange with the Superintendent of Public Instruction for a date for the inspection by one of the supervisors of country schools.

If it meets with approval, a date should be arranged with the State Superintendent for dedicatory exercises.

ILLINOIS SUPERIOR SCHOOLS.

The trend in educational progress in recent years has been strongly toward relating all school activities closer to life—the child's present and his future life. The criticism on the schools of the past is that they related to books only. This movement is sometimes designated "vitalizing the school" or "vitalizing education".

The consolidated school lends itself more readily to this kind of progress. There are more teachers, more pupils, more parents interested in the school and in the community life. This magnifies the importance of the school and its activities. Interest and enthusiasm are generated. There is more "life", hence, a greater interest in an improved life. When such interest is aroused, progressive, forward-looking ideas and purposes are more readily and kindly received.

While it is more difficult to arouse this interest in the best things for the children in the one-room schools, it is not impossible. Communities which are really interested in the best things for the children and have the leadership by the board and the teacher, can have what they want.

The Superior One-Room School is the realization of these ideals. It differs from the usual school in this,—that it has a teacher who not only teaches the school subjects in a superior way, but also has a definite idea of child life and needs, and has the skill to direct the activities which give the child the completest and most wholesome school life. She does not instruct and discipline only. She instructs and influences and in such a way that learning and wholesome living occupy the children's full time. She is also interested in the people in her district, secures their cooperation in the better life of the school.

The Superior school has a board of directors who have this vision of the better school. They cooperate with the teacher and support her in all her endeavors. They supply the material needs and encourage teacher, pupils and parents to do their best for the school.

The Superior schools can exist only in a community in which the people are friendly with each other, pull together for the best things in community as well as in school life, where they are willing gladly to take part in meetings at the school house where parents and teachers and children for a short time, live together to the best purpose.

REPLACING WORN OUT HEATERS.

Many of the school room heaters have been in use for from five to ten years. It is not strange that some of them need to be replaced. If they cannot be easily replaced with new ones or if these seem to be too expensive they can be replaced by home-made ones that will answer the purpose just as well.

Secure a large cast iron stove with a good grate that can be easily shaken to remove ashes and clinkers. The doors should be tight fitting. About this stove place a jacket which any tinner can make. Provide a fresh air intake as shown on page 12. This should extend through the jacket within two inches of the stove. The bottom sides and end should be closed, but the top should be open within the jacket. This will prevent the cold air falling to the floor. It will rise and pass out warm at the top. The end being closed will prevent cold air coming in against the hot stove and prevent the cracking of the fire pot. A close-fitting damper should be placed in the fresh air intake to close it or regulate the amount of air to come in. It should be hinged at the bottom toward the outside wall, the top extending inward. A chain should be connected to this damper and extend out through a small hole at the top of the duct. By drawing the chain up, the intake is closed. By letting the chain down the damper sinks to the bottom, leaving the duct open.

SPECIFICATION OF MATERIAL.

One sheet of heavy galvanized iron 11 feet long and 4 feet wide.

One sheet of galvanized iron 2 feet by 4 feet for door.

Two bars of iron 2 by 3/16 inches, 11 feet long, for rims inside the jacket at top and bottom for reinforcement.

One bar of the same width and thickness to reinforce the jacket at the middle.

Three bars of the same material 2 feet long for reinforcement of the door.

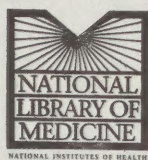
Four bars of iron 2 by 1/4 inches, 5 feet long, for legs and reinforcement of jacket, one placed at each side of the door and two placed three feet back

of each door post. These should be bent at right angles at the bottom to form a foot. A hole should be drilled for the screw to fasten them to the floor. The bottom of the jacket should be 10 inches from the floor. The iron reinforcements should be securely riveted to the upright bars serving as legs, forming the frame work. The galvanized iron should be securely riveted to the frame work. The door should be fastened with strong hinges and a latch. The final riveting of jacket should be done after it is in the house since it may be too large to take through the schoolhouse door.

The cost should be much less than that of a new heater. See illustration on page 12.

INDEX.

	PAGE
A word to school officers.....	3
Sanitary school rooms.....	5
The law governing sanitation.....	5
Duties of school officers.....	6-7
Heating and ventilation.....	8
Room heaters	8
Requirements and suggestions.....	8-14
Basement furnaces	14
Requirements and suggestions.....	5-21
Lighting	22
Requirements and suggestions.....	20-21-22-23
Seating	24
Requirements and suggestions.....	24-28
Water Supply	29
Requirements and suggestions.....	29
Toilets	30
Requirements and suggestions.....	31-34
Safety against fire.....	35
Inspection record	36
School houses	40
One room plans.....	40-52
Graded school plans.....	53-58
Standard schools	59
One-room, standard	59-65
One-room, superior	65-67
Home-made schoolroom heaters.....	67



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